

The Canadian Medical Association Journal



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FROM THE VAGUE TO THE CONCRETE IN SCIENCE AND MEDICINE

BY PROFESSOR FRASER HARRIS, M.D., D.Sc., F.R.S.C., F.R.S.E.

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THERE are several examples in the history of science where an idea at first represented by some purely metaphorical expression became in course of time a concrete existence. Most of the sciences have instances of it; one meets at first with a notion, often of the vaguest, a principle, a property, a potentiality for something or other, and one ends with a substance, a species of matter, tangible and ponderable; the notion has become incarnated.

Inorganic chemistry offers us an excellent case of this sort of thing. When Lavoisier was working out the character of the substance we now know as oxygen, he had not isolated oxygen by a stroke of genius and then proceeded to study the properties of the new chemical product; the history of its discovery is far otherwise. Acting on some hints given him in October, 1774, by the Englishman, Joseph Priestly (1733-1804), Lavoisier (1743-1794), came upon what he soon named as the "principle of acids" or "the acidifying principle"; his own words are (1777):

"I shall therefore designate dephlogisticated air, air eminently respirable, when in a state of combination or fixedness, by the name of acidifying principle or if one prefers the same meaning in a Greek dress by that of *oxygine* principle."

Here it is a "principle", something which combines with metals when they are calcined or burned in air; it is that something which to Lavoisier seemed essential in acids, that which produced

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acidity, the oxygene principle. In its later and more familiar form of "oxygen", it is better etymologically. Now that which was a principle in 1777 was about one hundred and twenty years afterwards a visible, tangible entity—the liquefied, steel-blue oxygen gas. The principle of 1777 had become a substance by 1897; the metaphor had become an actuality.

Not all chemical concepts have been equally fortunate in leading to true and individual chemical substances; phlogiston, for instance, denoting, as it did, no reality, is phlogiston the concept still. The principle of heat, phlogiston, was supposed to leave a body when it was burned: the theory of Stahl asserted that heat was a thing, a thing which could depart from a body and leave it lighter than previously when it was cold. Now this, as a conception, is quite satisfactory, but as it is not true in fact, phlogiston never materialized; it was never isolated from matter because it never existed in matter. Phlogiston was as barren as "oxygene" was pregnant. To-day, Priestley and Lavoisier could be presented with kilogrammes of the "oxygene" principle, but not a milligram of phlogiston could be extracted for Stahl, because oxygen is a substance, but heat is a mode of motion.

Chemistry furnishes us with another example of the thing in the mind becoming a thing in the outer world of matter, namely, in the history of the conception of the molecule. The atom as Dalton conceived it (1804) was the smallest portion of matter which could enter into chemical union with some other similar substance or could replace some other atom in a compound, thus forming a new compound. In course of time the Italian chemist, Count Amedeo Avodagro (1776-1856), became convinced that there must be bodies composed of two, three, or more atoms—compound atoms in fact—which could exist in a state of freedom, in gases for instance. Avodagro therefore coined (1811) the word "molecule" (the diminutive of moles a mass) "as a term of convenience" to express the conception he had of the smallest portion of matter able to exist in a free state.

Dalton's atom is the unit of chemical activity, Avodagro's molecule is the unit of physical structure. For many a day after Avodagro's time, the atom and the molecule were still "terms of convenience"; neither had been seen; but to-day both atoms and molecules are believed in as real existences; and as for molecules they have been weighed and measured.

The author of a recent text-book of chemistry writes thus: "The Brownian movement has revealed to us bodies intermediate

between ordinary particles and single molecules, and has enabled us to estimate the actual weight of molecules" "There is thus no question that molecules and atoms are real." Not only so, but the physical chemist can calculate the number of molecules in a given volume of gas. It has been computed that there are 72×10^{22} molecules in 22.4 litres of a gas at standard temperature and pressure. Thus the thing which began its existence in the world of the mind has become a thing in the outer world of matter; the conception has been discovered to correspond to a real, external physical entity.

Probably the most fruitful metaphor ever used in science was Harvey's as regards the movement of the blood—"motion as it were in a circle." This phrase was of course written in Latin as, "*an motionem quandam quasi in circulo haberet*"; it forms part of the sentence thus translated:

"I began to think whether there might not be motion (or a movement), as it were, in a circle. Now this I afterwards found to be true."

Later in the same chapter (VIII of the "De Motu") he writes:

"This motion we may be allowed to call circular (*Quem motum circularem eo pacto nominare licet*).

The establishing of the reality of the circulation of the blood was absolutely essential to the creation of physiology; modern physiology has, indeed, arisen from this one fact, and the fact received its name—circulation—from the well-known phrase, "circular motion". The metaphorical phrases "circle" and "circular" of 1628 became in due time part of the language of physiology; and the circulation of the blood, which was a phrase and an inference in 1628, became a visible demonstration in 1660. For it is a fact, one of the most pathetic in the history of biology, that Harvey died without ever having seen the blood moving as he knew so well it did, for he passed away in 1657, three years before Marcellus Malpighius—the man born in the year of the "De Motu", 1628—saw the blood in the living capillaries of the transparent lung of the frog. Thirty-two years separated the metaphor from the demonstration, the prophecy from the fulfilment. Had Harvey lived three years longer, he could have seen with his own eyes that what he had prophesied was correct, he could have been shown as an actuality what his reason had discovered as a magnificent inference, the most magnificent inference ever made in the realm of the knowledge of the living.

The next example we may take from physiological chemistry

and from that new department of it called "internal secretion". Until comparatively recently, the function of the two small yellow bodies situated near or on the kidneys—adrenals or suprarenals—was entirely unknown and barely even speculated upon. In 1855, Dr. Thomas Addison (1793-1860), of Guy's Hospital, London, described a disease, since named after him, in which the patient suffered from extreme weakness both of body muscles and of the heart, and after death was found to have had his suprarenal bodies degenerated usually through a tubercular lesion. Physiologists very properly assumed that the explanation of this was that in health the suprarenal bodies produced something which, gaining access to the blood, was carried to all parts of the body and maintained the efficiency or tone of the body-muscles as well as the heart and blood-vessels. This something was apparently absent from the blood in Addison's disease. This something remained undiscovered until 1895, when a watery extract of the suprarenal having been made and injected into the veins of a living animal, the result was such an increase in the tonicity of the animal's heart and arterioles that its blood-pressure rose to an astonishing height. Something contained in the suprarenal extract had evidently powerful physiological effects: let it be called "adrenalin". But it is one thing to name a hypothetical substance and another to isolate a real one. In this case, however, the hypothetical substance was a real one, so that after some years of work, between 1897 and 1904, the physiological chemists succeeded in separating from the glands a substance in a state of purity which had all the properties possessed by an extract of the suprarenals. Adrenalin was isolated for the first time about forty-five years after its existence had been surmised. So perfectly had the chemical something, the secretion that maintains the tone of heart and blood-vessels been isolated, that its chemical constitution was satisfactorily studied and the final triumph of making adrenalin synthetically not long delayed. In 1904 it was made synthetically in Germany, and in the following year in England, so that within fifty years of its suspected existence, adrenalin, with all the properties of the natural material, was seen and handled as a pure, crystalline, chemical substance of definite composition. Its structural formula has for some time been familiar to physiological chemists. Here we have literally the materialization of a chemical idea, the crystallization of a notion; the thing of the mind has become a thing of the laboratory, the thought has been captured and bottled.

The next "as it were" we shall take from the history of the physiology of the central nervous system as it is found in the writings of a pupil of Harvey, Dr. Thomas Willis (1621-1675). At the present day the name and the process "reflex action" is as well established as is anything in animal behaviour. One of the most certain things in the physiology of the nervous system is that if we stimulate a nerve going into that system, we shall produce outgoing effects, muscular contractions, vascular or glandular changes. If we decapitate a frog, hang up the body and apply a piece of acid paper to one flank, the leg of that side will be brought up to flick it off, and if the acid be very irritating the whole frog will be thrown into convulsions; these muscular movements are reflex actions. Now this very definite physiological conception of a reflex neural action arose in a metaphor, in an "as it were" of Willis penned about 1650. He said:

"We may admit that the impression of an object driving the animal spirits inwards and modifying them in a certain peculiar manner, gives rise to sensation; and that the same animal spirits, in that they rebound from within outwards in a reflected wave, as it were, call forth local movements."

Willis's notion was that of a wave reflected back towards its source; the metaphor about nerve-impulses being reflected evidently represented the truth, for the conception has lived on and become an integral part of the terminology of neural activity. If there had been no germ of accurate description in it, the idea contained in the metaphorical phrase "as it were reflected", would not have survived to our own day; but it has lived to become the definite description of a fundamental neural truth.

Dr. Marshall Hall (1790-1857), who did so much for the physiology of this sort of action, adopted the phrase and incorporated it in one of his own, the "reflex nerve-arc" which denotes the anatomical path over which reflected nerve-impulses travel. If Willis could visit our laboratories to-day, we could show him reflex actions performed with automatic precision, and below the microscope we could let him see the various links in a reflex nerve-arc. He would find his "as it were reflected" no longer taken in a metaphorical sense, but used as the appropriate mode of denoting one of the commonest and most important of neural activities.

The study of nerve-impulses gives us another example of the inevitable tendency towards concreteness and definiteness in notions reparding the behaviour of the central nervous system. If we go sufficiently far back we find the Greeks, for instance, imagining

that the nerve fibres conveyed spirits through their pores (poroi). No doubt these spirits of antiquity are the synonym of our nerve-impulses, something propagated with considerable rapidity from one end of a nerve to the other. Nevertheless, for ages that something was quite inaccessible to human sensation. Some physiologists imagined that muscles became active because the spirits of the nerves rushed into them, but Borelli (1608-1679), in 1670, on cutting open living muscles under water could see no bubbling of gas or anything else suggesting them to be inflated with any kind of substance—spirit, flatus, succus nerveus or gas. But it is to his credit that Borelli looked for something of the kind; he desired to render the succus nerveus concrete, to see, if possible, the action of the spirits in the nerves. It was not to be, for nerve-impulses are a mode of motion and only to be discovered through their effects. In our own day, one evidence of their passage along nerves, namely, the electrical, has been made perfectly obvious by that exquisite instrument, the galvanometer. By the aid of this very delicate apparatus, the electric currents produced by the nerve-impulses can be made to swing a mirror reflecting a beam of light on to a screen, it may be, several yards away. Although nerve-impulses are no more visible to-day than were the nerve spirits of the Greeks or was the succus nerveus of Borelli, we are in a position to show to these thinkers of the past a spot of light jerked two or three feet to the right or left of its resting position through the instrumentality of an electric current generated by a single nerve-impulse whose electromotive force is not greater than 0.015 of a volt. We have not rendered nerve-impulses evident to sight, but we have measured the electromotive force of their electrical manifestations as accurately as we measure the rise of temperature caused by the transference of minute quantities of heat.

We need not be surprised to be told that until comparatively lately it was universally believed that nerve-impulses travelled with incalculable speed, that a flash of thought and a flash of lightning were both prodigiously rapid. In 1850, Professor Helmholtz measured the velocity of the nerve-impulse, and ascertained it to be about one hundred metres a second in the nerves of man. Thus the movements of the spirits, once thought so erratic, have been measured; the intangible is still intangible, but the immaterial has been found to be in material and, as such, to be as real as the material, neither more nor less so.

Of late years there has been a very distinct tendency towards

concreteness in regard to ideas of nerve-force and its diminution in fatigue and in disease. At one time nerve-force seemed to be the special property of the quack and the charlatan, but the microscope, which has solved so many problems for us, has shed its light also on this most elusive problem. A substance has been discovered in the interior of nerve-cells which is found to accumulate as the cell rests and to be worn away the longer the cell has been active, a substance which takes the form of minute granules or prisms called after their discoverer, the granules of Nissl. The nerve-cells innervating the wing muscles of a sparrow have been examined in the early morning before the bird has begun to fly about, and similar cells have been scrutinized in a similar bird after a long day of activity; on comparing these two sets of cells under the microscope, the thing wherein they were found to differ was the quantity and appearance of the granules of Nissl. Since these granules tend to disappear when nerve-cells are active, and to reconstitute themselves when nerve-cells rest, they are evidently to be regarded as the physical basis of nerve energy, the local seat of the processes concerned in the output and in the restoration of nerve-energy.

It is clear, then, that the granules of Nissl are concerned with the evolution of nerve-energy and may be called the dynamogenic material or kinetoplasm which is widely distributed throughout the nervous system. But it follows from this that fatigue, in so far as it has a microscopical basis, will be denoted by the more or less complete disintegration of the granules. Fatigue which as understood by most people is merely a particular kind of feeling or sensation, has been shown to produce a cognizable change in some physical structure; in other words, it has been made concrete. General fatigue on its objective side has now been proved to be a condition of bodily poisoning. The prolonged activity of muscles and other tissues results in the output of certain chemical materials notably lactic acid, which, circulating in the blood, produce a mild poisoning, one of the effects of which is to depress the activity of the cells of the central nervous system, the objective sign of which is the partial solution of the granules of Nissl. Thus such comparatively indefinite and elusive things as nerve-force and fatigue have by the microscopists and chemists of our time been identified, and shown to have a local habitation and a general distribution respectively in the minute recesses of the living material of the body. The whole tendency here has been towards the objectifying of the subjective, towards the visibility of the unseen.

Even in the sphere of psycho-physics concreteness of knowledge has taken the place of a time-honoured vagueness. Within the last few years, thanks largely to the labours of Professor Carmon, of Harvard University, we have obtained surprisingly definite knowledge on the subject of the physiology of the expression of the emotions or such at least of these of which anger and fear are trifles.

It seems that the first effect of the uprising of a violent emotion is the stimulation through their sympathetic innervation of the super-renal capsules. These glands in consequence at once put out an increased amount of their specific hormone, adrenalin, which carried to the liver impels it to liberate dextrose from its stored glycogen.

The sugar is transported to the muscles where it is at once oxidized as the energy-yielding material for muscular work; at the same time the heart is stimulated to greater effort so that the blood-pressure rises, especially as the peripheral arterioles are simultaneously diminished in calibre. The muscles of the bronchial tubes are dilated, while the muscles of respiration are excited to increased activity. In this way air is permitted readier access to the depths of the lungs, and preparation is made to eliminate the increased quantity of carbon dioxide which, owing to the increased tone of the skeletal muscles, is rapidly accumulative in the blood.

It is very clear that all these physiological activities are destined to prepare the muscles for flight if the emotion is one of terror, for fight if the emotion is one of rage.

Cannon proved by actual experiment that all these physiological phenomena were produced in a cat which had been enraged at the furious presence of a barking dog. We have now for the first time a rational explanation of why the injection of large doses of adrenalin accelerates the heart and the breathing, constricts the body arterioles, raises the blood-pressure, increases the tone of skeletal muscles, decreases that of bronchial muscles, and finally produces an excess of sugar in the blood which is responsible for the sugar in the urine.

One more aspect of the physiology of emotion has been removed from the realm of the vague to that of the concrete. I refer to the bodily seat of emotion. We all know that the various emotions are expressed by the activity of various systems and organs; grief, for instance, being expressed by tears from the lachrymal glands, shame by dilated arterioles, fear by the blanching

of the cheeks, rage by the increased tone of the skeletal muscles and so on.

There is indeed quite a definite mechanism called into play to correspond to the mental commotion related to the increased central activity which most physiologists hold is the essential physical basis of feeling. But certain psychologists have perversely insisted that the particular state of the peripheral organ determines the emotion and vice versa; that, in fact, we feel shame because our blood-vessels dilate, grief because our tear glands secrete, fear because our muscles tremble and so on. These heterodox writers speak of emotion as a reverberation from the periphery into the brain, not as a rushing out of impulses from the brain to the periphery. What most of us believe, namely, that the cerebral cortex is the locus of the emotions was proved by an experiment performed on a dog by Professor Sherrington. The dog had had its central nervous axis cut across just above the medulla oblongata, so that it was a medullo spinal or decerebrate animal. This operation prevents the ascent into the brain of any impulses arising at the periphery below the head. Its viscera could send no impulses into the brain. Nevertheless the dog evinced all the emotions characteristic of such an animal; as its bodily tissues and all its viscera were entirely prevented from sending impulses into their origin at the periphery.

James' theory cannot be upheld; it is a putting the (physiological) cart before the (psychological) horse. Emotion has its seat definitely ascertained to be in the cerebral cortex and not vaguely distributed through the body generally.

Another example of the tendency in science to move from the vague to the concrete may be taken from the outcome of the work of Mendel. Put shortly, he discovered (a) that a property visible in the first generation could be inherited or reappear in the third generation, although no trace of it was visible in the second, and (b) that a given property could appear distributed amongst a certain number of descendants according to a very simple arithmetical ratio, one in three. Mendel (1865) worked exclusively with plants; but his work has been extended to animals where the same "laws" have been found to prevail. Such properties in plants as tallness or shortness, smoothness or roughness in seed-covering, and in animals, roughness or smoothness of hair, length of hair, colour of iris of eye, character of the comb or the wattles of fowls are all inherited in this definite or Mendelian fashion. Properties, then, such as tallness, roughness, colour, etc., can be

thought of and experimentally dealt with as entities, as concrete existences. It was a legitimate advance on Mendel's work to speak of the hidden "factor for" tallness or roughness, etc. But the whole concept of character or property became more definite still; there were physical, microscopic structures (chromosomes) in the germ cells which underlay the possession and transmission of properties. Thus Mendelians speak of the factor "for" this or that property because they have reason to believe that just as life as a whole has its physical basis in protoplasm, so certain properties have their physical bases in microscopic portions of protoplasm (chromosomes) in the male cells and in the female cells of both plants and animals.

No better example than that of the ferments could be given of a notion becoming in course of time a substance isolated and tangible. Fermentation, the totality of changes produced in digestible, coagulable or putrescible material, was for ages believed to be inscrutably mysterious. It was made the subject of debate between the iatro-mathematicians and the iatro-chemists of the seventeenth century, but neither school really understood it.

Digestion, the great fermentative process in animals, was confused not only with putrefaction, but with boiling and with the effervescence of gas in chemical operations. Stahl (1660-1734) saw in digestion the direct activity of the soul or anima which, he held, permeated every tissue and endowed it with its special powers. The chemistry of it all, however, was unknown; the very conception of a ferment—a substance produced by living matter but not itself living—had not as yet emerged from the mental confusion.

Van Helmont (1577-1644), Sylvius (1614-1672), de Graaf (1641-1672), Haller (1708-1777), all groped for it, but it was not until through the work of René Antoine Ferchault de Réaumur, about 1750, that any true notion was held as to the nature of fermentation in digestion. Réaumur was the first to obtain gastric juice in an approximately pure state and to attempt digestion with it outside the body. Spallanzani, the distinguished Italian naturalist at Pavia, began where Réaumur left off, and soon discovered (1777) that digestion was by no means putrefactive but was apparently due to some "solvent power" or "active principle of solution" in the gastric juice. Then by degrees as physiological chemistry improved its methods, it got finer results, and at last "the solvent power" or "principle of solution" in the gastric juice was isolated in 1862 as the white powder, pepsin, a name which

had been given to the active principle by Schwann as far back as 1836. Soon other ferments were either isolated or obtained in solution, and to-day in our laboratories we store in glass bottles half a dozen or more of those actual substances which are the modern representatives of the "principles of solution" of the early researchers. The vague has become definite, the conceptual power or property has become the material substance or entity.

Of course it is very largely in the sphere of the healing art that this modern tendency towards concreteness is seen in its highest perfection.

Let us take the case of Malaria or Ague, a disease the cause of which not so very long ago was absolutely unknown. Not that it was not attributed to causes such as "paludism", "telluric influences," "exhalations," "vapours," and so on, but these did not explain anything. The word malaria is derived from two Italian words meaning "bad air", clearly showing that the atmosphere was held to be responsible for some peculiar kind of corruption or infection as we should now call it. Paludism, the influence of marshes, could not be seen; what could be seen were fogs or vapours rising from the marshy ground, and these were blamed for spreading malaria, and people were told to beware of the damp and of night air. But why vapour, whether in the daytime or at night, should breed any kind of disease, most of all so definite a disease as ague, was not at all obvious. At last all these vaguenesses were dispelled, and malaria was discovered (1880) to belong to that already large group of diseases known as parasitic, the parasite in this case being of animal and not vegetable nature. Malaria was found to be due to the destruction of the red blood-corpuscles by their having been made the residence of a minute animal parasite, the *Plasmodium Malariae*, which had been inoculated into the patient through his having been bitten by a certain kind of gnat or mosquito (*Anopheles*) which had sucked blood from some one suffering from malaria. It was not contagion, nor ordinary infection, far less bad air, vapours or exhalations, it was natural, accidental inoculation with foreign blood containing excessively minute living creatures classed by zoologists as a species of Protozoa.

Thus the connexion of malaria with marshes and vapours and night-time was at once explained by the facts that the mosquito lays its eggs in damp places and frequents damp places towards evening and after dark. The meaning of the usefulness of quinine is explained by its being able to kill the parasite in the blood; it is simply a not too poisonous, local, circulating germicide. Thus

the microscopist has tracked down one of mankind's subtlest foes, found it neither mist nor marsh, vapour nor corruption, but a moving, living creature, a member of the lowest group of such known. The vagueness has gone; the cause of malaria can be viewed sealed up in Canada balsam under a cover-glass.

Another excellent example of the rendering definite what was before of the vaguest is the recent discovery of the cause of plague, the pestilence, or Black Death. In the fourteenth century the great surgeon of Avignon, Guy de Chauliac (1300-1370), attributed the plague to a conjunction of the planets Saturn, Jupiter, and Mars in the sign of Aquarius on March 24th, 1345. About the same time the Jews in Germany and Switzerland were suspected of poisoning the wells and were in consequence persecuted and massacred. In the fourteenth century the medical faculty of the University of Paris was asked to deliver an opinion on the nature and origin of plague, but a very great deal that it promulgated was absolutely fatuous as regards protection or cure. One thing only was recommended that is interesting in the light of to-day, namely, the fumigation of houses by the burning of aromatic herbs and woods. Only as recently as 1894 was the *vera causa* of the Black Death, one of mankind's most terrible afflictions, discovered by two Japanese doctors, Yersin and Kitasato, and named the *Bacillus pestis*. It was soon isolated in pure cultures, grown in artificial media, and its toxins and antitoxins became chemical entities.

The history of the discovery of what plague is really due to is a strange, eventful history. The Black Death, that most dreadful scourge of mysterious origin, was for centuries attributed to such sources as the conjunction of planets, the iniquities of the Jews, or to some special outpouring of divine wrath on account of human sin. Mankind, utterly at a loss to discover its true relationships, had for millennia imagined vain things, and essayed the most grotesque methods of averting it. But in the fullness of time the microscope was devised, and with it the dawn of the day of exact knowledge had arrived.

The source of the plague was shown to be a bacillus, a most minute, vegetable parasite, which growing in bodies of certain animals, rats and other rodents, could give rise to a virulent poison (pestiferin) which was carried to all parts by the circulating blood. It was further shown that man became inoculated by fleas which had been feeding on the bacilli-containing blood of rats. Thus were revealed the several links in that long chain which had the *Bacillus pestis* at one end and man at the other. It took mankind

three thousand years to come to a knowledge of the truth regarding the cause and manner of the spreading of plague, to a knowledge of that chain of cause and effect which connects microbe and man in the dire relationship of the plague-stricken.

Science, then, has come face to face with the spectre of the Black Death and recognized its features. She has laid hold of "the pestilence that walketh in darkness" and made it reveal its horrid origin.

Similarly, for Influenza, a disease in its epidemic form, if not quite as deadly as plague, then quite as mysterious; in some forms quite as deadly. Very probably some of the great epidemics of the Middle Ages were in reality what we now call influenza, its very name being only the Italian for influence, a something inscrutable but omnipresent, mysterious in the last degree. The usual expressions were in vogue, it was a corruption in the air, a miasma, an exhalation and so on; until in 1892 the bacteriologist Pfeiffer isolated the organism of influenza and named it the *Bacillus Influenzæ*. Not the air, then, but the microscopic fungi it may hold for evil influence, is the true cause of influenza. The influence is now materialized, nay indeed is isolated and sealed down under glass for the inspection of trained eyes. Thus by the microscope are these deadly powers of the air one by one distinguished from each other and identified each by its particular malignancy.

The story of the discovery of the telescope, how it was bound up with that wonderful emancipation of the human spirit from the thralldom of mediæval ignorance and the hatred of scientific light, has been told us by many learned men; but I venture to think that the discovery of the microscope, which has never yet had its historian or its poet, was one fraught with many more beneficent results for humanity. By its scrutiny the invisible but actual sources of most of the scourges of mankind have been discovered; and it would seem that it is in its power and not in that of fleets or armies that we must look for the physical salvation of the sons of men. Man may redeem himself from death, not by sweeping the heavens with the space-annihilating telescope, but by peering into the dust of the earth with the space-creating microscope.

We see then that the principle of the incarnation of ideas, of the realization in the world of substance of what had been vaguely foreshadowed in the world of mind, is a process which has gone on in science as surely if not perhaps so conspicuously as it has in art. The artist succeeds more or less perfectly in incarnating his ideas of beauty in stone, wood, metal, or pigment; but no painter

ever yet expressed all the loveliness in his mind, pellucid though his pigments were; the poet strives to give utterance to the majesty of his imagination, but no poet was ever yet satisfied that his words, choice though they were, portrayed all the delicacy of his fancy or the glory of his dreams. The musician is conscious that after he has swept the lyre with melodies of transcendent sweetness, there are unheard melodies that are sweeter still; the preacher, whose eloquence stirs the vast cathedral, returns home depressed with the thought that his burning words did not rise to the fever-height of his fervour. The saint, aiming at the highest ideals of holiness, has still to confess failure whether as anchorite, prophet, missionary, or philanthropist.

But it is sometimes given to the man of science to touch, to taste, to handle what was once only a notion, a suggestion, a forecast either in his own day or in that of a less fortunate predecessor in the earlier times of the history of a thought.

DR. WILLIAM D. BRYDONE JACK, of Vancouver, has been appointed superintending engineer of the public works department for the provinces of Manitoba, Alberta and Saskatchewan. Dr. Brydone Jack is a native of Fredericton, New Brunswick.

SANITARY RECORDS OF HOUSES

By J. A. BAUDOUIN, M.D., D.P.H., M.O.H., LACHINE

Professor, Laval University, Montreal

MANY very important health problems are being studied by the members of this Congress. Is it not then a reason for the question of house sanitation to be considered very carefully?

HOUSING PROBLEM

It is useless to speak at great length on the relation which exists between the sanitary conditions of houses and the health of the people living therein.

Professor Leonard Hill in his "Report on ventilation and the effects of open air and wind on the respiratory metabolism", published in 1914, truly says: "Over-heated rooms and still air decrease the activity of the body furnace and so lead to lessened vigour and resistance to disease. Excessive protection from cold weather by over-clothing, over-heating and shutting off of wind lessens immunity and increases the susceptibility to such diseases as pneumonia and phthisis."

The mortality rate is influenced by the condition of the home as is amply proven by statistics collected by Dr. J. B. Russell, late medical health officer of Glasgow, Scotland, which I find in the Ontario Public School Hygiene, by Professor A. P. Knight, of Queen's University, Kingston:

Size of house	Percentage of total number of deaths
One room.....	27·0
Two.....	47·0
Three rooms.....	13·0
Four rooms.....	4·3
Five rooms and upwards.....	3·3

And the statement made in Paris in 1905, at the International Congress on Tuberculosis, stands true: "The problem of sanitary housing will always be considered most important in the prophylaxis of tuberculosis."

Quoting "Hygiene and Public Health", by Parkes and Kenwood, we find another proof of the influence of the conditions

of houses on the mortality rate from tuberculosis: "The part which over-crowding and foul air play in promoting the prevalence of phthisis is well shown at Salford (Dr. Barry and M. Gordon Smith's inquiries—data supplied by Dr. Tatham). Thus, in districts where all the houses were built on the vicious system known as 'back to back', the phthisis death-rate was 5.2 per 1,000 living; where 56 per cent. of the houses were so built, the rate was 3.6; where 23 per cent. only were so constructed, it was further reduced to 3.3; and, lastly, where there were *no* 'back to back' houses—that is to say where all the houses were provided with some means of light and air in front and to the rear—the rate was only 2.8 per 1,000."

Even the narrowness of the streets bears on the tuberculosis mortality rate as is shown by the following statistics from Paris: In an ordinary street the mortality rate by tuberculosis was found to be 6 per cent.; in narrow streets, it increases to 16.46 per cent.; and in very narrow streets, it reaches 18.84 per cent.

The following conclusions have been further established by M. Paul Juillerat, the director of sanitary records of houses of Paris:

1. The mortality by tuberculosis increases in ratio with the height of buildings.
2. Tuberculosis is met with more often in the lower flats than in the upper storeys of houses.
3. A house showing a high tuberculosis death rate is practically never isolated. The near-by houses are also affected with more or less severity. There are houses and groups of houses which are intense foci. Tuberculosis is to be found there permanently.
4. Mortality by the other contagious diseases does not follow the tuberculosis mortality. There is no correlation between these two causes of death.
5. The cause of the high mortality in the tuberculosis houses is to be found in the house itself, it consists in the want of light and mostly in the want of sun. Tuberculosis is above all the disease of darkness.

Other authorities might have been also cited, but these figures and quotations are sufficient to show that there is a housing problem involved.

The science of hygiene must be able to define the conditions of sanitary housing.

Public health officers must draft by-laws, if need be, or enforce existing by-laws in order to insure to the population decent conditions of housing.

SANITARY HOUSING

What are the conditions of sanitary housing? This important question has been studied by scientists and to-day these conditions are known. They relate in brief in the following: Soil, aspect, lighting, ventilation, warming, plumbing, cleanliness.

I will not give any demonstration on these conditions. They are too well known by the members of this Congress and the modern text-books fully illustrate them.

But the practical question to be considered is this. To what extent are these conditions realized in the dwellings occupied by the numerous labouring classes of our cities and how can the insanitary conditions found be corrected in the existing houses and prevented in new houses?

SANITARY RECORDS OF HOUSES

The only practical way for the municipal health authorities to know the housing conditions of the population is by instituting the sanitary records of houses. Its object is to record exactly and continually the sanitary conditions of all the dwellings in a municipality.

The organization of the sanitary records of houses is not a new thing. Brussels has had such a record since 1871, Moscow also for a long time. Berlin has had a sanitary statistic of its houses since 1874. Hâvre started its own in 1879, then came Saint Etienne in 1883, Amiens in 1884, Nice in 1887, Paris in 1893, Nancy in 1903, Orleans in 1905. Since that date many other cities in Europe have been provided with a similar organization.

The record includes the sanitary description and history of houses. Each dwelling has its record regarding the following points: Street, number, designation (house, store), nationality of inhabitants, number of rooms, number of persons, previous contagious diseases, deaths, appearance (cleanliness, No. 1, good; No. 2, unclean (want of ventilation); No. 3, bad; water closet located in a room provided with a window, ventilated, bath, dark rooms, how many, nuisance in cellar, water in cellar, air-holes in cellar, nuisance in yard, stable, plumbing (siphons to sinks, etc.), soil pipe above roof, wet walls, privies, sketch of the house, date. When needed, this information can be completed by figuring the number of cubic feet of air available in the house, the open space around the house, etc.

In the province of Quebec every municipality is authorized to organize the sanitary records of its houses by Articles 3,896 and 3,931 of the Public Health Act, which contain the following:

Article 3,896. The municipal sanitary authority shall cause the immovables situated within the municipality to be visited from time to time, by its executive officer, or the other officers in its service to ascertain whether there are any nuisances.

Article 3,931. The members, officers and employees of the municipal sanitary authority may enter any immovable to make the inspection which they deem necessary.

When insanitary conditions are found at the inspection of the houses, remedies can be applied to the extent that the law and by-laws permit. Important statistical data can also be obtained.

IMPROVEMENT OF DWELLINGS

The insanitary conditions found are the following: Uncleanliness, water closets located in dark, unventilated rooms; dark rooms; overcrowding; cellars used as dwellings; defective plumbing; humidity; absence of bath; privies; open manure boxes; insufficiency and even absence of open space around the house.

(a) Enforcement of the law. When in a dwelling the co-existence of many insanitary conditions is found to the extent that such dwelling is considered unhealthy, the municipal sanitary authority, by virtue of Article 3,907 of the Public Health Act, may cause the inmates to leave it and forbid their return until the premises have been improved.

(b) Enforcement of the by-laws. Two cases can here be met with.

On one hand the dwellings, without being absolutely unhealthy, are nevertheless not built in conformity with the by-laws in force; or, on the other hand, the by-laws do not apply to certain defective buildings because they have come into force after their erection.

When houses are found not built in conformity with the by-laws already in force the remedy provided is the enforcement of the by-laws and the fine. We must ascertain therefore, the point at fault in the house and the date the articles of the by-laws regarding this particular point were published in the *Official Gazette* of Quebec. Some articles were published on June 13th, 1891, and can be applied to all houses built since that date, and the other articles on October 13th, 1906.

But the difficulty may present itself in many cases to know the exact date a house has been built and to prove it.

As for the houses built prior to the dates aforesaid mentioned, the law affords no help whatever to obtain the improvements found to be necessary at their inspection.

If it is admittedly good to improve the houses already built; is it not even better to prevent the same faults against the by-laws in the houses before they are erected? The correction of these faults necessarily entails expenses, whereas their prevention costs nothing. But it is possible for all municipalities with a population of ten thousand or over, to obtain such a result by the application of Article 39x of our provincial by-laws which provides, as follows:

"It is forbidden to proceed with the construction of buildings, houses and dependencies of any kind, as also the remodelling of existing structures, without submitting the detailed plans and specifications thereof to the municipal sanitary authority and to have obtained the approval of its executive officer. Such approval shall only be given when the plans or specifications show that the carrying out of the provisions of the present by-laws have been provided for."

The execution of the plans can be controlled by a system of inspection made during the course of erection and carried out until the building is finished.

These considerations show the legal means actually at our disposal to improve in some measure the defects in houses and to prevent them. But there is also another very practical method which could be resorted to and in many cases would bring out the best of results without using in any way the rigours of legal procedures. Unhappily, it is yet forbidden to us to make use of it, because so far it has not been provided for in the law which should be completed in this particular point. It consists in having the tenant instructed on the insanitary conditions found in the house he occupies and thus interesting him in asking the landlord to apply the proper remedies, making of it even a condition of the lease. I earnestly hope, for the best protection of the community, that before long our laws will be amended accordingly.

Nevertheless, it is not enough to obtain from the law somewhat extended powers, but these must be applied. And it is for this reason that I have organized in my own city of Lachine, of which I have the honour to be the medical officer of health, the sanitary records of houses with the following result:

SANITARY RECORDS OF HOUSES IN LACHINE

The work, started during 1914, was completed only at the end of 1915.

All dwellings, stores, offices, etc., within the city, making a total of thirty-one hundred and nineteen, have been thus inspected by the sanitary inspector according to the following formula. The description of the house is completed by a sketch of the same given on the reverse side of the formula. The inspection of the hundred and two dwellings and stores erected in 1916 has completed up-to-date, the records of all our houses.

CITY OF LACHINE

BOARD OF HEALTH

Sanitary Records of Houses

Street.....	No.....
Designation { Dwelling.....	
{ Store.....	
Nationality of occupants.....	
Number of rooms.....	Number of occupants.....
Contagious diseases.....	
Death.....	Disinfection.....
Appearance (cleanliness)*.....	Water closet..... Ventilated.....
Placed in a room provided with a window.....	Bath.....
Dark rooms.....	How many.....
Nuisance in cellar.....	Water in cellar.....
Cellar with ventilation.....	
Nuisance in yard.....	Stable.....
Plumbing, sinks provided with siphons, etc.....	
Soil pipe above the roof.....	
Wet walls.....	Privies.....
Date.....	

* 1, Good; 2, Dirty (want of ventilation); 3, Very dirty.

The result of the inspection showed that the population of Lachine is composed of twenty different nationalities, in the following proportion:

HOUSES AND STORES OCCUPIED BY

French Canadians }	1,396
French	
English }	1,079
Scotch	
Irish	
Jews.....	134
Austrians }	52
Germans	
Gallicians }	

Russians	}	47
Rumanians		
Italians		46
Polish		29
Indians		19
Syrians		11
Chinese		11
Greeks		9
Swedish		3
Danish		2
Unoccupied		281
Total		3,119

We were further in a position to know the most important insanitary conditions of our houses. They are as follows:

1. Uncleanliness. The great majority of our houses, exactly twenty-five hundred and thirty-one, or 89 per cent., are kept in a proper manner. Two hundred and forty-seven houses (8.9 per cent.) have been found dirty, and sixty (1.6 per cent.) very dirty. The proportion of dirty houses is made up mostly of those occupied by families of foreign nationalities—Austrians, Russians, Polish, etc.

2. Want of window in the rooms wherein are placed the water closets. The inspection of our houses shows that in sixteen hundred and thirty-six houses, or a proportion of 52.4 per cent., the water closets are placed in rooms not provided with a window.

3. Want of ventilation in the rooms wherein are placed the water closets. In one hundred and sixty-five houses (5.2 per cent.) such ventilation is made through the house only, to the great annoyance of the people living therein.

4. Dark rooms. In Lachine we had two hundred and forty dwellings (7.6 per cent.) with this very important insanitary condition, two hundred and twenty-three had one dark room, seventeen had even two.

5. Overcrowding. (a) Our twenty-seven hundred and sixty-one occupied dwellings are divided as follows, according to the number of their rooms:

Dwellings of 1 room	12
Dwellings of 2 rooms	49
Dwellings of 3 rooms	209
Dwellings of 4 rooms	710
Dwellings of 5 rooms	736
Dwellings of 6 rooms and over	1,045
Total	2,761

(b) The number of occupants in each class of dwellings is the following:

Dwellings of	Number of occupants
1 room.....	33
2 rooms.....	140
3 rooms.....	783
4 rooms.....	3,308
5 rooms.....	3,780
6 rooms and over.....	6,146
Total.....	14,190

(c) The average number of occupants in each class of dwellings is the following:

Dwellings of	Average number of occupants
1 room.....	2·85
2 rooms.....	2·85
3 rooms.....	3·74
4 rooms.....	4·65
5 rooms.....	5·13
6 rooms and over.....	5·88

The average is, therefore, 4·18 persons per dwelling.

(d) The average number of persons per room in each class of dwelling, is the following:

Dwellings of	Average number of persons per room
1 room.....	2·85
2 rooms.....	1·42
3 rooms.....	1·24
4 rooms.....	1·16
5 rooms.....	1·02

The average number of persons per room in these five classes of dwellings is, therefore, 1·54.

These figures show that on the average our dwellings give a very favourable result.

To find out the places where overcrowding exists the exact number of persons living in each class of our dwellings must be known. This is shown by the following figures:

(e) The number of persons living in dwellings of one room is the following:

Number of dwellings with 1 person.....	5
Number of dwellings with 2 persons.....	2
Number of dwellings with 3 persons.....	1
Number of dwellings with 4 persons.....	1
Number of dwellings with 5 persons.....	1
Number of dwellings with 6 persons.....	2
Total.....	12

(f) The number of persons living in dwellings of two rooms is the following:

Number of dwellings with 1 person.....	7
Number of dwellings with 2 persons.....	13
Number of dwellings with 3 persons.....	15
Number of dwellings with 4 persons.....	9
Number of dwellings with 5 persons.....	4
Number of dwellings with 6 persons.....	1
Total.....	49

(g) The number of persons living in dwellings of three rooms is the following:

Number of dwellings with 1 person.....	4
Number of dwellings with 2 persons.....	47
Number of dwellings with 3 persons.....	56
Number of dwellings with 4 persons.....	47
Number of dwellings with 5 persons.....	24
Number of dwellings with 6 persons.....	20
Number of dwellings with 7 persons.....	6
Number of dwellings with 8 persons.....	3
Number of dwellings with 11 persons.....	1
Number of dwellings with 12 persons.....	1
Total.....	209

(h) The number of persons living in dwellings of four rooms is the following:

Number of dwellings with 1 person.....	9
Number of dwellings with 2 persons.....	83
Number of dwellings with 3 persons.....	135
Number of dwellings with 4 persons.....	146
Number of dwellings with 5 persons.....	119
Number of dwellings with 6 persons.....	102
Number of dwellings with 7 persons.....	53
Number of dwellings with 8 persons.....	29
Number of dwellings with 9 persons.....	19
Number of dwellings with 10 persons.....	6
Number of dwellings with 11 persons.....	7
Number of dwellings with 12 persons.....	1
Number of dwellings with 14 persons.....	1
Total.....	710

(i) The number of persons living in dwellings of five rooms is the following:

Number of dwellings with 1 person.....	1
Number of dwellings with 2 persons.....	82
Number of dwellings with 3 persons.....	128
Number of dwellings with 4 persons.....	120
Number of dwellings with 5 persons.....	129

Number of dwellings with 6 persons.....	101
Number of dwellings with 7 persons.....	64
Number of dwellings with 8 persons.....	44
Number of dwellings with 9 persons.....	29
Number of dwellings with 10 persons.....	21
Number of dwellings with 11 persons.....	6
Number of dwellings with 12 persons.....	5
Number of dwellings with 13 persons.....	3
Number of dwellings with 14 persons.....	2
Number of dwellings with 16 persons.....	1
Total.....	736

In Articles 43b and 43c of the provincial by-laws a minimum of three hundred cubic feet of air is required for each person, which is far from being excessive. We can, therefore, draw the conclusion that all the dwellings in which the number of occupants is such that there is not to be found for each one of them the minimum asked for by the by-laws may be considered as overcrowded. We have found overcrowding to a greater or less extent in one hundred and six houses.

6. Plumbing. In forty-six dwellings we have found plumbing to be grossly defective, and in twenty-six others we have found that there was even no soil pipe.

7. Dampness. We have found water in the cellar of eight dwellings, thirty-seven unventilated cellars and twice damp walls.

8. Bath. In the majority of our houses there is no bath.

9 Privies. We have found fifty-nine privies.

10. Open air space around houses. Most happily, with the exception of but a few houses, our dwellings are fronted by a street of proper width and have in rear a yard large enough. Our "back-to-back" houses are very few indeed.

From the sanitary records of houses we learn further the distribution of contagious diseases, because the record of each dwelling shows all the contagious diseases outcoming therein. Thus we see that since June 2nd, 1913, up to March 18th, 1917, we have registered a total of eight hundred and forty-nine cases of contagious diseases, forty-four of which being tuberculosis, distributed in six hundred and forty one dwellings, as follows:

1 case of contagious disease in	519 dwellings
2 cases of contagious diseases in	93 dwellings
3 cases of contagious diseases in	21 dwellings
4 cases of contagious diseases in	4 dwellings
5 cases of contagious diseases in	3 dwellings
6 cases of contagious diseases in	1 dwelling

19'83 per cent. of our dwellings have been visited by contagious diseases during this period, covering nearly four years, and during the same period a proportion of 1'36 per cent. have received tuberculous people.

But the finding out of the insanitary conditions of our dwellings is only the first part of the work. This must be followed naturally, by the classifying of all our houses according to the insanitary conditions found in order to undertake their systematic improvement. Thus we have made a division of dwellings with privies, with manure boxes, with dark rooms, with defective plumbing, etc. With all the indispensable information in hand we have started, in 1916, the necessarily long work of having all the insanitary conditions removed one after the other, or as much as circumstances permit.

1. Privies. The first war was undertaken against the privies to have this nuisance removed according to the authorization given by the health by-laws. Out of fifty-nine privies found, twenty-six were located on streets not yet provided with sewers and accordingly did not come under the by-laws. But there was a balance of thirty-three against which it was in our power to act. Notices have been addressed to all interested with the result that thirty privies have been removed. The three ones remaining are tolerated until we have heard from the landlords responsible.

2. Manure boxes. To keep up the cleaning-up campaign inaugurated in spring 1914, we have put into effect Article 53 of our by-laws which states that manure boxes must be closed. Due notices have been addressed to the two hundred and thirty-eight citizens who were keeping manure boxes within the limits of the city, repeated inspections have also been made by the sanitary inspector and to-day we are pleased to see that practically all manure boxes are made and kept in conformity with the by-laws; therefore, in all those places which are known as the favourite breeding places for flies, these insects will be prevented from multiplying so rapidly and acting as a cause of contamination of food.

3. Overcrowding. The figures given regarding the overcrowding of our houses apply to 1915 only; the same result would not have been found in 1916, on account of the unusual present circumstances for thousands of men are now working in large shops. These exceptional conditions of work have been the cause of a great increase in our population whereas, during the

year, only one hundred and two new houses have been built. Therefore, there was a notable increase in the number of persons per each dwelling, many families using only a limited space to receive boarders in one or two rooms. But it has seemed to us better not to interfere in such cases because we have considered this state as only temporary and limited to the length of war.

4. Dark rooms. We have started a vigorous campaign to obtain their improvement as much as circumstances permit in each case.

Upon the first visit of the inspector, when the sanitary records of the houses were made up to the end of December, 1915, we found two hundred and fifty-seven dark rooms.

During the summer of 1916 a second inspection of these houses was made to complete the information already obtained by the drawing of a sketch showing the location of the dark room and the best means to be adopted to admit therein directly the light from outside. At this second inspection two hundred and thirty-one dark rooms were found. This result shows that through the explanations given by the inspector at his first visit proving that these rooms were not favourable to the health of the people living therein twenty-six landlords had understood that it was in their interest to correct this insanitary condition in so many houses.

Encouraged by this first success, new illustrations were given to those interested in the improvement of these two hundred and thirty-one dark rooms, with the result that at the end of the year 1916 the number of dark rooms had been reduced to one hundred and sixty-four. Through these peaceful ways we have obtained the correction of ninety-three dark rooms in only one year. This is a proof that in many cases the landlords have the best of intentions and when correctly informed are willing even to incur expenses in the interest of the health of their tenants.

Following these encouraging results a new effort has been tried to improve the balance of one hundred and sixty-four dark rooms. To that effect, during the month of December the following letter has been addressed to all the interested landlords:

Sir:

The sanitary state of dwellings bear considerably on the health of the families living therein. And one of the most important qualities of a sanitary house consists in giving a wide access to light and mostly to sun light. Because it is proved by science that germs of contagious diseases, and mostly the germ of tuberculosis, can live

very long in darkness, whereas they die quickly when they are exposed to the light and are even killed in a few minutes by the rays of the sun.

The municipal health authority, the object of which is to protect the health of the citizens, has therefore the duty to start a campaign against the deadly dark room, the true nidus of tuberculosis. And it is for this reason that it has received the following authorization from the Superior Board of Health of the province.

Article 43 h. bis. The municipal sanitary authority may set on the wall of any room which has no window a notice reading as follows: This room having no window, opening directly outside the building, cannot be used for either day or night occupation.

An inspection of the house bearing No....street.... owned by you, has shown in such house the existence of a room having no window opening directly outside the building.

Consequently in conformity with the law and with the purpose of protecting the health of the families living in your house, we will be in the obligation of setting the said notice if the proper repairs are not made within the delay of eight days.

The notice was set accordingly with the result that so far thirty-one more dark rooms have been removed leaving a balance of one hundred and thirty-three more. It is our intention to keep up this campaign until all the dark rooms which can be remedied are effectively improved.

5. The other insanitary conditions of houses shown in their records will now be dealt with and we will make due efforts to have them corrected. To that effect a new complete plumbing by-law has been prepared which will be a great help in improving a great number of our houses in which the plumbing is far from being perfect.

In order that the same insanitary conditions may be prevented in new houses, they are kept under control during the whole time they are being erected. To this effect the sanitary inspector has made three hundred and eighty-two inspections during last year and we are pleased to state that the one hundred and two new dwellings and stores erected in 1916 are all built in conformity with our by-laws.

As a conclusion, may I be permitted to submit the following resolution:

1. That at least all the important cities in the Dominion be invited to organize the sanitary records of their houses.

2. That the law in the province of Quebec be amended to the effect that the executive officers of the municipal boards of health be authorized to communicate to the tenants the insanitary condition of the house they occupy.

3. That the present resolution be addressed to the parties interested.

THE old agricultural buildings at Winnipeg have been enlarged and converted into what is now the Manitoba Military Convalescent Home, which has accommodation for seven hundred soldiers. As in other convalescent homes under the direction of the Military Hospitals Commission, classes are held in vocational training of all kinds and ample provision has been made for recreation. A library and reading room have been provided by members of the Grain Exchange in memory of Cadet George Morton.

THE CARE AND TREATMENT OF MENTAL DEFECTIVES

BY HELEN MACMURCHY, M.D.

Toronto

HOW many mentally defective persons are there in Canada? The best way to answer this question, at present, is to ask another. How many insane persons are there in Canada?

In the province of Ontario, for example, with a population of about two and a half millions, we have at present about seventy-five hundred inmates in our provincial hospitals for the insane; or about three per thousand of the population.

It has been found in Great Britain, in the United States, and wherever else this matter has been investigated, that the number of mentally defective persons in the community closely approximates the number of the insane; and in Canada so far, all the facts we have ascertained seem to make it probable that this may be said to hold good here. Moreover, the number of mentally defective children found in our elementary schools is also, apparently, comparable with the number found in the English elementary schools, about 2 per cent.

Why has little or nothing been done for the care of mental defectives?

Because "knowledge comes, but wisdom lingers".

About a hundred years ago, soon after 1801, Itard and Seguin, and others, drew attention to the necessity of caring for the lowest grade of mental defectives, those who were then spoken of as "idiots", but whom we now think and speak of as "persons having a mental age of about two years".

Before the nineteenth century ended, two new discoveries were made in regard to mental defectives.

1. It was gradually found out that there was a higher grade of mental defectives, those who were at first called "imbeciles", but whom we now think and speak of as mentally defective persons having a mental age of about three to seven years.

2. Then it became known, about 1880, that there were persons

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who were certainly mentally-defective, but of a still higher grade, those whose mental age was from seven to twelve years, or even higher.

Now comes the point! Our practical action, our "wisdom" in dealing with mental defectives is about one hundred years behind our knowledge. We still are dealing with the problem of mental defectives as if we had only the low grade cases to deal with, though we all know that the care of low grade mental defectives is the smallest and easiest part of our problem. Consider for a moment the relative numbers alone of the three grades.

Tredgold, in his book on "Amentia", gives the percentage figures thus: Low grade, six; middle grade, eighteen; high grade, seventy-six. This is confirmed by all other authorities on the subject. "Knowledge comes, but wisdom lingers!"

How should mental defectives be cared for, and treated?

In principle—

A good deal like normal people. They need first, a suitable environment.

Persons of subnormal mentality cannot fit into a world intended for normal people. We must make an environment for them; that is, an institution.

Perpetual children must have perpetual care.

They need, second—

To develop their gifts and capabilities.

All mental defectives have gifts and capabilities, (of course, there are exceptions to all general rules) and the use of these powers and gifts has secured the success of the work at the many farm colonies, on the cottage plan, in the British Empire, the United States and other countries, where thousands of mental defectives are now cared for.

Why should we do anything about mental defectives?

1. Because this is a form of national service.
2. We are the ones who know most about this question.

If we do not do anything to help about mental defectives, who will?

We owe it to the country that gave us our medical education, to help Canada in national medical problems, and this is one.

3. Because mental defectives drag down the standard of public health.

If they were properly cared for, public health would be greatly improved. Consider the rôle of the mental defective in transmitting tuberculosis, syphilis, and other transmissible diseases.

4. Because if mental defectives were properly cared for, it would—

Reduce the number of illegitimate births.

Reduce, by 50 per cent., the number of women arrested for prostitution.

Reduce, by from 10 to 20 per cent., the number of criminals.

Reduce, by 80 per cent., the number of unemployables.

Reduce, by 30 to 50 per cent., or more, the number of inmates in charitable institutions.

5. Because if mental defectives were properly cared for, they would leave no children behind them to carry on this problem in a worse form to the next generation. As the *British Medical Journal* said, in discussing this question: "Our duty to our neighbour must now be held to include our duty to posterity."

The right to life and happiness is one thing; but the right to parenthood is another.

What shall we do about mental defectives?

1. Give proper instruction on this subject to all medical students.

2. Help to educate the general public, especially judges, lawyers, clergymen, teachers, and other leaders of public opinion about this question.

3. Promote and improve medical inspection of schools by every means in our power, so that mental defectives may be recognized.

4. Support and encourage the movement for special or auxiliary classes for all children needing special training or education, so that they may be taught what they *can* learn, and not what they *cannot* learn. Four Provinces have these classes now.

5. Aid and assist in the formation of voluntary associations for the care of the mentally defective. Nova Scotia and Ontario have already formed such associations.

6. Direct and encourage the movement to establish (on a small scale at first, but with ample land provided for) farm colonies on the cottage plan.

7. Assist in securing the necessary legislation, by Royal Commission, or other means.

8. Assist in securing the proper medical examination of all immigrants.

9. Give every assistance in our power to the movement in favour of a Dominion Minister of Public Health.

HYSTERIA IN THE MALE

BY CAMPBELL MEYERS, M.D.

Toronto

A. B.—admitted to my private hospital January 23rd, 1917; occupation, bank clerk; age, twenty-three; born in Canada; father, Scotch; mother, Canadian.

Family history. Mother of decidedly nervous temperament. Her general health is fairly good, although she suffers at times from rheumatism. Present age about fifty-five. Father's health excellent. Two brothers (one at the front), both healthy. No sisters. The paternal grandfather, who was inclined to alcoholism was a weaver by trade. He was devoted to literature, chiefly philosophical, which he developed as a hobby, and his whole life became gradually absorbed in this occupation. His literary attainments were a source of great pride to his family. Patient's father and brothers all very temperate. The maternal grandfather said to have become senile at seventy.

Previous history. As a child he was afraid of the dark, and had violent fits of temper without sufficient cause. He began school (kindergarten) at three years of age and remained until five when he went to public school and passed entrance examination at eleven. The progress in his education which had been uncommonly rapid until this age, began to diminish quickly owing to a change in school so that he was obliged to spend two years in the first form of the high school. This he attributes to a difficulty in following the more advanced subjects which he could only grasp with much effort. During the third year progress was very slow. His eyesight at this time was defective but he felt he could not grasp the subjects as well as previously, although certain subjects he learned with uncommon ease. He left school in his sixteenth year as he was making no progress. He had been suspended for a month at a time for bad behaviour. During his twelfth year he learned to smoke cigarettes, and often played truant, etc. His school days after eleven years of age were filled with mischief of various kinds, and he frankly admits he deserved all he received

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in way of punishment. He says that before eleven his progress at school was remarkable and he was much flattered by the praise of his teachers. After this age and in a different school, as he began to lag in his studies, he did not get on with his teachers and consequently his vanity suffered. He has been a very heavy smoker, usually of pipes and cigars during the past year and a half. No alcohol or venereal disease. He has read much theology, eugenics and sexual psychology, and is inclined to be very argumentative on these subjects, which he says he always read in preference to the "best sellers". Never read novels for amusement but for what he could learn relating to his own bent. Has evidently dwelt much on sexual matters.

Says that while he gets on well with his parents and appreciates his home he feels he is not understood there, and a lack of sympathy is experienced by him. He entered bank soon after leaving school and has remained in it ever since. For two and a half years he was a junior but his salary was always increased yearly. Manager of his bank reported very favourably on his services during his first five years. Towards the latter part of this time he began to be troubled with weakness in knees and he also then noticed that some inaccuracy was becoming evident in his work, such as placing entries on wrong side of ledger or in counting cash, etc. This became more marked, so that he on one occasion paid out \$400 too much owing to his being confused. He found he would tire very rapidly and while able to stand quite well until 12 o'clock, by 3 p.m. he was often utterly tired out. During this period there was an excess of night work. At this time he found it necessary to work on all public holidays. On June 30th last, for example, he began work about 9 a.m. and after a busy day until five he found there was \$20,000 to be counted, which kept him busy until 1 a.m. the following morning.

Present illness. He obtained leave of absence on July 2nd, 1916, on account of his condition. For several days prior to this date he found when tired that his knees were weak and legs were heavy, with pains in the calves at times. His writing had been steadily deteriorating but he had no special difficulty in using the pen. He always used a short pen-holder in preference to a long one, because he could write better with it. He had gradually become more liable to make mistakes in addition and was obliged to exert greater effort to avoid doing so, especially when tired, and noticed he always made more mistakes towards the close than at the beginning of the day. He also noticed that in doing an excess of

certain forms of work, which were largely mechanical (such as paying cheques on special pay-days), he would make fewer mistakes, although more exhausted after it. He was troubled with frontal headache at these times which was not relieved by glasses. Complained of pain from knees downward in both legs. He was unable to stand for any length of time unless he braced himself to do so. Weakness was fairly constant. Did not complain of his arms. A heavy meal would make him dizzy and bilious, so that he would be obliged in the street to cling to some object or he would fall. He did not think much about his condition at this time. Constipation pronounced. He would tire easily mentally. Was advised by physician to take trip and went down Hudson for ten days. He was, he says, at this time restless, irritable, and tired of everything. Trip not of service. On return did light reading and loafed for about two weeks. He then went to the woods with a friend and knocked about, felt somewhat better and returned August 31st and worked irregularly for a few hours daily for one week and then went on September 5th, 1916, to another city, where he acted as accountant. Work here not heavy for first few weeks, but he was depressed, easily tired, and smoked heavily. During this time he got on fairly well. Gradually, however, he found his work more difficult owing, partially at least, to his own condition. Says he would limp around office, that "he would pull his feet around" without raising them from floor. Did not notice anything unusual about hands, although he had been troubled intermittently since previous spring when he noticed pen would slip from his fingers unless handle was large. He was under medical treatment from November 1st for weakness of knees, general weariness, and an "all in" feeling with sleeplessness, difficulty in adhering to his work although fond of it, and felt he was incapable of doing it after repeated but unsuccessful efforts. This terminated on December 4th in an attack of muscular spasm, general in its distribution. No special cause of which he is aware to induce this attack, except pressure of work as he was both teller and accountant. It came on in evening, when he says he had a feeling of hysteria. He noticed first symptoms at bank of rubbing hands together and extreme restlessness of hands. He then went to see a doctor, who took him home and a complete attack developed, all the muscles of the body being involved, but voice or speech not especially affected. The attack started about 7 p.m., gradually increased and lasted till 1 a.m. He did not lose consciousness at any time that he is aware of. He got out of bed about eleven

and went down stairs during a lull, where he found the people much excited over his condition and his doctor was telephoned for. He thinks at this time left leg was more affected, although later in his disease the right leg suffered most. The spasms were at times very violent, and he says they were a great relief in a way as he felt much better after them owing to the tension being relieved. No urinary trouble or bowel movement during attack. On awakening the following morning he had a very violent attack. Later, however, he got up and started for the office, but during this time was much troubled by involuntary movements of hands and feet, which made dressing difficult. He met his doctor on his way to the bank, who promptly sent him back to bed. His speech at this time was not affected. He says his recollection of this whole week (December 4th to 11th) is defective and indistinct, probably because he thought his illness was only trifling and temporary, and consequently did not consider the details with much care, although he had daily attacks of variable intensity. He went home on the 11th and entered a general hospital December 13th. The attacks continued daily. He says he was quite well psychically being cheerful, reading, etc., to occupy his time, and enjoyed visitors, although tired after his friends had gone. He slept much during the day and wakeful at night. He left this hospital December 28th. That afternoon he noticed for the first time that his speech was affected. This occurred when at tea with a friend and his wife, the latter of whom patient was only slightly acquainted with. He said he was not feeling very well this afternoon, being tired and somewhat low-spirited. He noticed for the first time that he stuttered in his speech and this was regarded with amusement both by his friends and himself. From this time onwards it became more pronounced, so that at times he could not form coherent words. The letter "D" troubled him most. His speech heretofore had always been perfect. He was taken to a private asylum on December 30th. After a few days (probably a week) his speech suddenly recovered, and while on one day it was disturbed he found on awaking the following morning that it was normal. It remained all right, except when he was under emotion, such as that which occurred from seeing another patient who was, he thought, being harshly treated, which terrified him, although this patient was very violent and had to be controlled. He said when troubled that he could not find the right words to express the meaning he desired to convey, and that to him the cause of the trouble was psychical rather than physical,

and that he did not recognize any physical difficulty in the organs of his voice.

He feels that the right side of body (arm and leg) have always troubled him most.

On first entering the hospital on January 23rd last, one was at once struck with his gait and the disturbance in his speech. He walked with much difficulty, aided by a friend and the use of a cane. His speech was so much affected that he could not make himself understood. He could hear and appreciate all that was said to him, and his actions were intelligent but he could not express himself owing apparently to an inability to articulate. His gait was that of an organic hemiplegia, the right leg being brought forward with a circular motion in a very typical manner. An ankle clonus, typical of an organic disease in its character, was obtained in the right ankle. As he arrived at night and was exhausted from his journey, further examination was postponed, and he was at once sent to bed, leaving one with the strong impression that an organic hemiplegia was present.

On January 27th patient was seized with a convulsive attack involving all his skeletal muscles, lasting about half an hour. These attacks recurred daily for the few following days and then at longer intervals until February 27th, when with the general improvement in his condition they ceased for the time, retaining, however, during this period, their general characteristics, but with much variation in their intensity. Between the attacks he spoke slowly and with evident difficulty, but he could be quite clearly understood. He expressed great anxiety during the first ten days of his treatment, about his mind and said he could not understand why he had been placed among the insane for treatment unless his mind was affected. Constant reassurances from me that I had no anxiety in regard to his mind gradually relieved him, but his nervous condition was much intensified and his sufferings greatly aggravated by his treatment with the insane. As the attacks decreased in frequency the speech and the ability to walk improved so that by the end of March his speech was normal and he could walk for some miles without difficulty. He said he felt very well and desired to give up his treatment. As he still exhibited an unnatural restlessness and a lack of emotional control considerably below normal, I advised him to continue his treatment. His parents, however, did not realize the gravity of his condition, probably owing to reports of his apparent physical health, and contrary to my advice, he left the hospital on April 2nd last. He

did not go to his own home but to that of some relatives, where there was a trained nurse in the house. These relatives were excellent people and did their utmost to aid him to maintain his convalescence. The surroundings were as good as could be desired, as walks in the woods with plenty of fresh air, quiet, etc., could all be obtained. Within ten days, however, it was evident he was not so well and the mistake in his removal from direct medical care became evident. On April 13th, after the receipt of a telegram from his home suggesting a change in his plans which were not in accord with his wishes, he developed a severe convulsive attack which was followed by inability to walk, and he was brought back to the hospital. He attempted to walk into the building with the help of two friends but he was practically carried in, his legs dragging uselessly after him. He was at once put to bed and developed a severe convulsive and very noisy attack, lasting about three-quarters of an hour, after which he became quiet and passed a good night. As he had no further attacks at this time he gradually recovered his ability to walk so that in ten days he could get about fairly well with the use of a cane and within one month his recovery of the use of his legs seemed complete so that he could enjoy all kinds of physical exercise. The improvement in his mental tone was also very noticeable, his confidence in himself and his self control being much better. As he was so much improved it was thought advisable to permit direct communication with his home, which had hitherto been entirely denied to him. The result, however, was not satisfactory (I may add there was no other change in his treatment or surroundings at this time), and he developed two slight convulsive attacks, one on June 3rd and one on June 4th. Both these attacks were much modified in their severity in comparison with those he previously experienced, and in a few days he was continuing his progress towards recovery. The outlook at present is for a complete restoration to his normal health, and if nothing unforeseen happens, I expect to send him for a long canoe trip about the first of July with the confident hope that he will be able to resume his work on his return.

In a paper necessarily much curtailed in view of the variety of the details during a prolonged illness, only a *general review* of some of the most striking symptoms can be given. The attacks were often preceded for a few days by disturbances of the alimentary canal such as constipation, anorexia, complaints of biliousness, and a general feeling of malaise which were not relieved by ordinary measures. In addition, at these times, he was irritable, fault-

finding and discontented. The immediate cause of the attack was apparently some disappointment, usually slight, in his wishes, such for example as the denial of some amusement, the refusal of a cigarette, etc. This latter was at once followed by physical restlessness, such as tapping of the ball of one foot on the floor, rubbing of hands, and inability to sit quietly in a chair. Then he would begin to walk up and down at first pounding his feet heavily on the floor as though endeavouring to overcome his muscular irritability and control the attack. After a few moments of these efforts, the feet would gradually become stiffer in their action and he dragged or rather scraped along the carpet so that in a moment further locomotion was impossible and he would fall headlong on his face, without, however, doing himself any serious injury. He then would be seized with clonic convulsive movements, general in their distribution and equal on both sides of the body. This was accompanied by inarticulate voice sounds, variable in their intensity and with an occasional explosive sound resembling somewhat the bark of a dog and evidently produced by a spasmodic contraction of the diaphragm. The muscular movements were not extravagant and only on one occasion did he throw himself out of bed. Neither his pupils, respirations, nor colour of his face suggested an epileptic attack. His consciousness although dimmed was not at any time completely lost. The convulsions ceased gradually and were not followed by sleep. The attack usually lasted from one to three quarters of an hour. His memory of what had taken place during the attack was hazy but not lost. Between the more frequent attacks he was in a dreamy condition. He was apparently awake and replied correctly to all questions, but spontaneity of thought and expression was very defective. He appeared at times intensely sleepy and would pass into an intense sleep for several hours from which he could only be aroused with difficulty. On being awakened he appeared like one aroused from the profound sleep following complete exhaustion. After an attack both his speech and his gait were more affected.

The physical examination showed a well nourished young man in apparent health. The deep reflexes were all somewhat increased but equal on the two sides of his body. No ankle clonus could be obtained after the first examination. The superficial reflexes were all present and active on both sides, except the plantars which were absent. There was no Babinski; no stereognosis. The cutaneous sensibility showed a marked dissociation. Tactile sensibility, with location of touch, and sensibility to heat and cold were every-

where good, except the conjunctival reflex which was absent in right eye. Sensation of pain, however, was markedly disturbed, the right leg being completely analgesic and the skin of it could be everywhere transfixed by a needle without eliciting more than the sensation of touch. The entire right lower extremity was thus affected and was sharply limited above by a line corresponding to Poupart's ligament and the crest of the ilium. The left lower extremity was similarly affected but to a lesser degree. Sensibility to pain on right half of face, tongue, trunk and right upper extremity were somewhat diminished, especially on comparison with the corresponding areas on left side which seemed in comparison hypersensitive to pain. The eyes presented the ordinary stigmata of hysteria, the fields of vision being concentrically contracted to about one third of their normal extent. The optic discs, the pupillary reactions of the eye movements were all normal. The examination of the muscular system was most interesting as it showed no paralysis or even weakness of any muscle or group of muscles in the body when resistance was applied in the ordinary manner. There was no incoördination of muscular movement and a passive movement on one side of the body could be imitated quite well, with the eyes closed, on the other.

He stands as well with eyes closed as when they are open, being unsteady in both instances. His weight chart shows a gain of $7\frac{1}{4}$ pounds in weight. Urine normal and other organs healthy. No increase of temperature at any time.

The history of hysteria dates back to the very dim past. You all know of the old reverie of Plato in which he states that "the matrix is an animal which longs to generate children and when barren, it feels wroth and moves about the whole body, closing the issues for the air, stopping the respiration and occasioning various diseases, etc.". When this belief held sway it was the reign of sibyls, witches, convulsionists, etc., the malady supposedly affecting females only. It was not believed that males were affected until the time of Raulin, who, in 1758, was the first to maintain that there were hysteric men. This changed the old conception of hysteria, as is shewn in the more recent works of Brodie in 1837, Bracket and Landouzy in 1845, Duchenne de Boulogne in 1855, Briquet in 1859, and more latterly Charcot, who founded the clinic at the Salpêtrière and among whose pupils none have written more brilliantly on this subject than Pierre Janet. I mention a few of these great explorers of the domain of hysteria in order to emphasize the fact that while different ex-

planations of the phenomena of hysteria have been advanced from time to time, the basic symptoms of this wonderful disease have ever remained the same in all ages and in all races.

Might I here be permitted to add, in humble tribute to a great master, that it was in following the teachings of Charcot and in watching his clinical demonstrations for a considerable period, that I received a profound impression of the importance and reality of the symptoms of hysteria, an impression which time has served only to intensify. While the various stigma of hysteria as noted in the above history each merit a careful separate study, such as the disturbances in the digestive system, in the eye, in the cutaneous sensibility, in the speech, and also the disturbances in the muscular system, such as the convulsions, and the paralysis, a lack of time forbids a discussion of more than one of these stigmata.

In a previous paper on "Some eye symptoms in hysteria", I endeavoured to discuss the chief disturbances of vision met with in this disease. The disturbance of speech, associated as it is in the above history with a lesion involving especially the right half of the body, is most interesting from its possible anatomical relations, this being emphasized by the fact that in the earlier stages when the left leg was chiefly affected no disturbance of speech was noted.

May I now refer to one of the striking objective symptoms, viz., the motor paralysis—how paradoxical does it appear that a man with good muscular power in his legs is unable to walk! Yet in this strange disease many such cases have been recorded in which with a total inability to walk the patient could jump, hop, or skip, or do any muscular movements with his legs while in the recumbent position. We have been so accustomed to assume that a patient who is suffering from a paraplegia is not only unable to walk but must have a paralysis of all forms of motion in his legs, that when any of these latter are retained we are at once inclined to regard him as a malingerer or simulator and thus relieve ourselves of the trouble of further and serious investigation. Is this justifiable? I think not, in a disease in which the same symptoms have been described by competent observers and in all nations and classes for centuries. Grant if you wish (however absurd the proposition) that knowledge of all the symptoms of hysteria are known to those patients, how many would be able to stimulate them in their entirety for one day, not to mention the weeks and months or even years during which these symptoms may persist. Moreover, the fact that many of the symptoms of hysteria are unknown

to the patients themselves, and are only discovered by the careful examination of a physician (for example the eye symptoms), shows clearly that a simulation of this disease as a whole is impossible. Certain isolated symptoms may be feigned for a purpose, but a knowledge of the disease, with all its definite manifestations, will enable the physician quickly to detect the malingerer.

Let us now, however, "*revenir à nos moutons*" and discuss further the cause of this inability to walk. In considering this it would be well to mention also other corresponding troubles which occur in hysterics in the upper extremities, in which some functions of the hands are lost, such as a needle woman becoming unable to sew, an ironer to handle an iron, or an inability to write or play the piano, although there is no paralysis of the hands. Such instances as these, as Janet says, are sufficient to prove that there are very often systematic paralysis, in which a certain system of movements, grouped by education, separates from consciousness and takes an existence of its own. There is a dissociation of function here, due to lack of conscious control—an amnesia of the movement—which prohibits function in regard to this movement. Suppose, for example, an individual learns to drive an automobile, the use he makes of his feet and legs, develops a new function for his lower extremities and groups together images in a fresh centre which have never been grouped before. Should he by any chance forget this new function at a later date it need not prevent him from utilizing all the other functions of his legs which he previously possessed, such as walking, etc. Is there an anatomical basis for many of the stigmata of hysteria? It is highly probable that the functional association corresponds to an anatomical association but this can only be elucidated by further study. On one point, however, we may be certain, viz., that the starting point of hysteria is in a disturbance of the higher functions of the encephalon.

If these few and very imperfect remarks will serve to stimulate the study of this most important disease, which offers such a broad field for both psychical and somatic investigation, I am sure an abundant harvest will be reaped by all who cultivate it, more especially as the numerous cases of so-called "shell shock" return from this terrible war, in which the nervous strain is unprecedented in the history of the world.

A SHORT SERIES OF CASES OF CARCINOMA OF THE CERVIX UTERI

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DURING February of the present year we were struck by the unusually large number of cases of carcinoma of the cervix uteri admitted within a short time to the gynæcological ward of the Royal Victoria Hospital. Having so many cases at one time has prompted us to report them, and I am indebted to Dr. Chipman and Dr. Fraser for the privilege of doing this.

There were in all ten cases. It is noteworthy that five of these were very young women—aged twenty-six, twenty-nine, thirty-one, thirty-one, and thirty-two years respectively. Three others were in the forties; one was fifty-two and the other sixty-seven years of age. All the women were married, but two of them had never been pregnant, thus affording an instance of cancer of the cervix uteri in nulliparæ. Of the two nulliparous women, one had never menstruated except a few times at the onset. She is now thirty-two years old.

The Wassermann reaction was negative in every case. The blood count did not show anything characteristic. All had a moderate leucocytosis of ten thousand to twelve thousand. One advanced case, and one case with a pelvic abscess showed large leucocyte counts.

All had secondary anæmia of varying degrees. There were no abnormal red cells. Only two gave a history of carcinoma in the family.

The important symptom in every case was bleeding. The amount varied from spotting to a profuse hæmorrhage. Two cases had a good deal of leucorrhœa early in the disease. Pain is a late symptom, and was not present at all in some of them.

I would like to give you a little of the histories they gave. It is interesting to see how long some of them bled before consulting a physician.

1. Mrs. F.—8628, gynæcology—age sixty-seven years. Began

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to bleed per vaginam seven years after the menopause and has continued for the past thirteen years. Ten years ago she had a curettage and hysterectomy was advised, but for some reason refused. The long duration of this case is an example of the different degrees of resistance offered to carcinoma by different individuals.

2. Mrs. F.—8591, gynæcology—age fifty-two years. She began to bleed five years after the menopause. She bled five months before going to a doctor. He did not make any vaginal examination, but gave her some medicine to take.

3. Mrs. R.—8627, gynæcology—age forty-three years. Began about July, 1914, with a flooding. She thought it was an abortion. Since then has had menorrhagia and metrorrhagia. Leucorrhœa and pain after about one year.

4. Mrs. L.—8634, gynæcology—age thirty-one years. Had a foul-smelling bloody discharge six weeks before going to a doctor. He examined her thoroughly, and said she had carcinoma. Sent her to the hospital. This is an operable case.

5. Mrs. S.—8624,—age twenty-nine years. She had bled two months, then came to hospital first.

6. Mrs. McG.—8500, gynæcology—age thirty-one years. Began with spotting after periods, about five years ago. For the past two years spotting a little every week; gradually increased to daily red spots. Profuse leucorrhœa along with spotting. She did not consult a doctor for about one year after spotting began. Pain came on very late in this case.

7. Mrs. R.—8632—age forty-eight years. Began about six months ago with foul leucorrhœa. About one month ago had a severe hæmorrhage, which her doctor thought was a miscarriage. He packed her and sent her to the hospital. She had practically no pain.

8. Mrs. B.—8611—age twenty-six years. She has been losing blood per vaginam for the past three years. Never consulted a doctor before coming to the hospital. Has had pain for the past six months only. This is an advanced case, with a pelvic abscess.

9. Mrs. D.—8645—age thirty-two years. She never menstruated after a few times at the onset, so when she began to lose blood in June, 1916, she thought it was the menstruation returning. When it did not cease after several days she saw a doctor. She has been undergoing local treatment for the past eight months. Admitted March 7th, 1917. This case is still operable.

10. Mrs. H.—8348—age forty years. She was bleeding six months before going to a doctor. She was then treated for six months in his office. No definite diagnosis was given, although she had severe hæmorrhages following the treatments. She was admitted to the Royal Victoria Hospital in October, 1916, with an inoperable carcinoma.

Of course the all important question is treatment. I think all agree that in an operable case the treatment is radical removal with the knife. What do we mean by an operable case? It is one where the disease is confined to the cervical cylinder, or the body of the uterus, and in which the vagina, bladder, rectum and parametrium are not involved, and the uterus is freely movable. Unfortunately, the majority of cases do not come until they have passed the operable stage. Six of our cases were inoperable.

What palliative measures can be employed in the inoperable cases? Three of the best are formalin, iodine, and cauterization by heat. The principle is the same in all. They clean up the growth, get rid of the secondary infection and consequent foul discharge, diminish or stop the hæmorrhage, and cause more or less cicatrization or fibrous change.

We are particularly concerned to-night with the method of cauterization by heat through the medium of the electric cautery of Percy. There are two ways of using the cautery,—at high and low temperature. It has been demonstrated in the laboratory that carcinoma cells are killed by a temperature of 113° F. maintained for ten minutes. Percy is a strong advocate of low heat. He maintains that it does not char or carbonize the tissue next to the cautery, but coagulates it throughout the tumour mass. His operation is to open the abdomen, insert the cautery point to the fundus at a low temperature, and use only as much heat as an assistant (who holds the fundus in his hand) can stand. The uterus is cooked for an hour, or until there is no further fixation. If there is thickening in the broad ligaments the cautery point is directed into them also, until they too lose their fixation. Byrne was an early advocate of high temperature. Here the cautery is at a red heat—temperature approximately 800° F. The tissue is quickly charred.

Many unfavourable results have been reported following the use of the cautery. Leonard, of Baltimore, states that the sequelæ are practically those following superficial burns, due to the toxic products of broken-down proteid from squamous epithelial cells, *i.e.*, gastric and duodenal ulcers, hæmorrhagic exudates into the

serous cavities, particularly the pleura and pericardium, degenerative processes in the central nervous system and epithelial necroses in the parenchymatous organs, particularly the kidneys. Injury to the red blood cells also occurs at 113° F. Hence the ligation of the internal iliacs and ovarian arteries, which is frequently practised before cauterization.

The cases reported here were treated with high temperature, *i.e.*, the cautery was at red heat and the abdomen was not opened. Three of the cases were cauterized in this service at some previous time.

Mrs. R.—8627. She was first seen in July, 1915. The cervical cylinder was the seat of a cauliflower-like growth. The uterus was fixed. There was infiltration in both broad ligaments. She was considered inoperable. The Percy cautery was used at red heat. A piece of the growth was cut, and showed typical squamous cell carcinoma. On discharge the uterus was fixed and a nodule was felt in the left parametrium. She had no more bleeding, not even any menstruation, and she was readmitted February 24th, 1917, nineteen months after the first cauterization—complaining of cramp-like pain in the hypogastrium. The uterus was large and cystic, but fairly freely movable. The abdomen was opened, and a panhysterectomy done. The cervical canal had been obliterated and the menstrual blood retained. This accounted for her colicky pain. The parametrium on the left side of the uterus was involved, and a small area at the base of the left broad ligament remained. The microscopic slide from the fundus shows a growth very atypical of carcinoma. It is very fibrous, with only a few scattered areas of cancer cells. It is remarkable what an improvement there was here. After a year and a half she was better than when first seen. Of course a great deal of the fixation when first seen must be explained as inflammatory.

Mrs. H.—8348. Was first seen October 9th, 1916. Carcinoma was at the level of the internal os. The parametrium was involved. The case was inoperable. She was bleeding a good deal. Cauterized with the cautery at red heat. She was re-admitted in March, 1917, after five months. There had been no further bleeding, but a foul leucorrhœa—but the condition was wonderfully improved. There was a fibrosis, or cicatrization. The condition, however, is slowly involving the parametrium and bladder. She was cauterized again at the second admission.

Mrs. M.—8004. Was first seen in April, 1916. The cervix

was eroded, and was the site of an extensive, rather firm cancerous growth extending to the vaginal wall and parametrium. The condition was hopeless. The canal and uterus were cauterized. In May, one month later, she was discharged with the cauterized surface well healed—no tenderness. After a few months she developed pelvic pain which radiates down the thighs, due, no doubt, to infiltrated nerves. However, there is no bleeding, and she has passed almost a year without much progress of the disease.

Three of our cases ran a septic temperature after cauterization. One of these, however, was septic before, from a pelvic abscess. There are three modes of death in these cases:

1. Hæmorrhage.
2. Blocking of ureters with ascending infection.
3. Obstruction of the bowel.

One operable case of cancer of the uterus with ovarian cyst was up and about the ward only last week. She was suddenly taken with a very free hæmorrhage and almost bled to death, although a house surgeon happened to be in the ward at the time and packed her immediately. She recovered, following a subcutaneous saline, but had minor hæmorrhages almost daily following, and died March 26th, 1917. Autopsy showed an extensive erosion of the body of the uterus, with entire absence of the cervix. There was extensive infiltration into the surrounding tissue and a vesico-vaginal fistula, probably the result of the packing necessary to control the hæmorrhage.

One other case came to autopsy and showed (beside the carcinoma of the cervix with extension into the parametrium) a pelvic abscess, septicæmia and a sero-fibrinous pleurisy on the right side, not, however, any hæmorrhagic fluid in any of the serous cavities, and no gastric ulcers.

In conclusion, we cannot be too careful to find out the cause of bleeding in women, especially after the menopause. The treatment of carcinoma of the cervix or of the body of the uterus is radical operation, where the condition is an operable one. In inoperable cases, the best treatment is the Percy cautery at red heat.

THE DEFICIENCY DISEASES OF INFANCY AND CHILDHOOD

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THE term *vitamines* was introduced by Casimir Funk in 1912 to designate certain organic bases, the importance of which was recognized as the result of experimental studies on beri-beri. It was demonstrated that the ætiology of the peculiar disease was associated with the lack of the above substance in foods, which has been deprived of the important elements contained in the outer layer or husk of the grain of cereals by too extensive milling, or by the consumption of a diet subjected either to prolonged heating or heating under pressure.

The name *vitamines* has been applied to these substances for two reasons. In the first instance they are undoubtedly proven to be indispensable to life. It is not exactly known what their physiological function is, but the assertion that they are indispensable is an indisputable fact. In the second place they belong to the class of organic bases exhibiting certain specific chemical characters. A better plea cannot be brought forward in support of the appellation *vitamine*, than by referring to the well-known fact that an animal is able to live longer when food is withheld altogether than when all the known constituents of a diet, with the exception of the *vitamines*, are supplied to it.

The chief chemical properties so far observed are that they are isomers of adenine and soluble in alcohol readily obtainable from yeast through precipitation with a colloidal hydrate aluminium silicate preparation known as Lloyds' reagent. The various *vitamines* are destroyed by different degrees of heat and hence become inactive.

With regard to the physiology of the *vitamines*, it cannot be explained as yet why these substances are so indispensable to

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the animal organism, but certain facts in this connexion which have been gathered so far must be mentioned. First, Funk found that animals fed on white rice showed very marked changes in the chemical composition of the brain. This finding is possibly important, as the most characteristic feature of deficiency diseases is a group of symptoms arising from the central nervous system. It is possible that these changes are due to the half-starved condition of the animals. Another important fact which was discovered a short time ago is that a definite relationship exists between the onset of certain deficiency diseases and the amount of carbohydrates consumed. It was already known for some time to those who had studied beri-beri from the clinical standpoint that with an increase in the consumption of polished rice, the onset of the disease can be hastened. It is also known that deficiency diseases in childhood (especially rickets and tetany and probably scurvy) occur when proprietary foods consisting chiefly of starch make up the bulk of the dietary, this observation we have fully confirmed in the wards and laboratory at the Children's Hospital.

With regard to the influence of vitamins on metabolism some important facts are known. Although the measure of their importance on metabolism is at present obscure, active experiments have demonstrated that in the absence of vitamins the entire metabolism of organic and inorganic constituents goes wrong, especially is the relationship between the $\frac{Na+K}{Ca+Mg}$ interfered with.

In the various researches in diseases of children of to-day, no group of abnormal conditions has received such intensive study as rachitis, scurvy, tetany, osteogenesis-imperfecta, infantile beri-beri and pellagra, these diseases, especially the first four, class themselves under the one heading, deficiency diseases, as they are more or less interrelated ætiologically, possess a striking similarity in symptomatology, and respond to a greater or lesser degree to an allied therapy.

Up to the age of six or seven months, in many cases longer, an infant is fed exclusively on milk. Under normal conditions there is no doubt that mother's milk is an ideal infant's food, but in these days the force of circumstances or numerous other factors, not ordinarily granted much deserved attention by the medical attendant, may so change the composition of the mother's milk that it ceases to be a complete food. This failure to be a complete food cannot so far be demonstrated in the laboratory by the ordinary chemical analysis, an analysis to which so many practitioners have attached so much importance. One need not go

further than to observe the well-known fact that frequently, during pregnancy and lactation, mothers will desire and seem to exist upon a diet which is badly chosen from the standpoint of our recent knowledge of modern physiological standards. We are all ready to admit that frequently these abnormal cravings are in the direction of articles of diet which have a very doubtful nutritional value and from our standpoint also very doubtful powers of maintaining a metabolic balance. May we not, therefore, analyze the congenital deficiency diseases, or those appearing soon after birth in breast fed babies, as deriving causative faction from the deficient maternal diet just referred to. Sufficient analyses of much milk have been made, however, in the case of mothers where nursing infants have died from infantile beri-beri, to show that the lacking factor in the diet cannot be a deficiency in proteins, inorganic salts or even fat and as the infantile malady can be cured precisely like the adult type, by an administration of an extract of rice polishings, it seems logical to conclude in the light of present knowledge that the two are caused by a deficiency of the so-called vitamines. It is likewise probably true that the maternal organism is unable to synthesize vitamines unless they are supplied in the food to the lactating mother. These important facts are not generally known by those who have developing and growing children in charge, and as a result we have a deficiency in the metabolic requirements in many breast-fed infants, with scurvy or rachitis, or both, as frank manifestations and "difficult feeding cases" with even less understood ætiology as more occult manifestations. The above facts are also in perfect agreement with the plentiful evidence that the deficiency diseases of later life, markedly osteomalacia, occur more frequently in the female and more especially during the child-bearing period. We can easily verify all these facts by the animal experiments which have been reported by many observers. Unusual physical exertion also requires not only additional calories but also additional vitamines, and especially is this true when unusual demands are made upon the powers of the carrying or nursing mother. Pigeons if forcibly exercised and plentifully fed on polished rice develop severe symptoms of beri-beri while controls at rest and on the same diet during the same period of time remain far less affected; in fact pigeons at rest may remain free from any discernible symptom of beri-beri for an unusually long time even though fed on an exclusive diet of polished rice and then, if suddenly exercised, will develop all the symptoms of beri-beri in a few moments.

From these observations we will now pass to the consideration of the artificial feeding of infants on modifications of whole cow's milk, and in handling this problem there are two main points of consideration. First, when milk is subjected to certain degrees of heat either by sterilizing or pasteurizing, experiments recently conducted go to show that the destruction of vitamins or growth element content is destroyed at certain degrees of temperature. Neuman and Heubner conducted investigations years ago which showed conclusively that infants fed on pasteurized milk entirely may develop scurvy. These researches were disregarded for a number of years, in fact their results were questioned by some for a long time. To-day the same evidence which was brought forward by Neumann and Heubner is finding growing acceptance. The fact that orange juice might be given as early as the first month with benefit was admitted by several observers years ago. Recent evidence tends to show that in over-heated milk the factor which disturbs the normal metabolic processes of the nursing infant is not a chemical change in the casein or other protein of the milk as McCallum believes, but is due, as has been proven by recent observations, in which the author in conjunction with Dr. George Smith has been particularly interested, to the inactivation of a definite substance in raw milk which prevents pigeons fed on polished rice from developing beri-beri in the usual length of time. Undoubtedly a vitamin. Secondly, the growth element content of cow's milk is by no means a constant factor; it is entirely dependent on the same, or at any rate similar conditions among cows, as has just been discussed in regard to nursing mothers. More particularly does this deserve our attention when we recall that in the summer the cows, or other milk-giving animals, gain their supply of fresh food directly from pasturage, while in the winter the food has been subjected to drying, curing and storage, all tending toward inactivation of the vitamin content. Actual epidemics of deficiency diseases among calves and then cows have been described by Lötsch as occurring during the winter in the poorer districts of Switzerland. There is no doubt that if more attention were centred upon these facts that many cases of rickets, as well as some of the other deficiency diseases, would find an aetiology more definite than that with which they are at present dismissed.

Passing to the child of runabout age, why is it that the deficiency diseases are still manifest when food other than a pure milk dietary is offered. Highly milled cereals cooked interminably to

say nothing of the amount of starch solutions already forming the diluents of feeding formulas, were previously prescribed in most cases. Actual experiments upon rats fed with certain of the so-called patent foods have proved beyond doubt that most of such preparations are not sufficient to maintain life, to say nothing of promoting growth, though they contain enough protein substance with all the "necessary amino acids" as laid down by Osborne and Mendel. One may argue that the results obtained in rats may not apply to human beings. Granting that, we still learn that something is missing in certain of these foods, a something which was probably destroyed in the process of its manufacture, since the test animals thrive very satisfactorily if they are fed with the raw materials from which most of these foods are made, or else if some adjuvant containing the missing substances is added to the baby food. The "missing substance" is contained in fruit juice and yeast and both must be administered to make a complete food for the rat. In the added fact that babies fed on the above food, exclusively, are the commonest victims of the deficiency diseases, especially rachitis and scurvy and tetany, we have the "evidence before the fact" as the lawyers put it.

Now we know from the researches of Funk that the foremost functions of the vitamins are to influence carbohydrate metabolism, especially that of the starches, and that when this substance, or these substances, are not present in proportionate amount to the increased starch content of the dietary the metabolism fails, its balance is destroyed and the patient suffers from the minor or major manifestations of disturbed nutrition or growth, entirely independent of the caloric value of his food intake or its inorganic constituents. Be it in its mildest form of so-called "difficult feeding cases" or in the severest form of rachitis or even death, the cause is the same and the resulting condition simply a matter of degree. What is our problem therefore? Either to diminish the quantity of carbohydrate, principally the starches, or else to supply substances such as fresh or very lightly cooked vegetables, or certain extracts which are known to obtain a marked excess of these essential substances. To do the former would mean a loss of calories to the child; to do the latter rarely fails to prove of decided benefit. It is held by many of our most prominent students of nutrition that excessive housing or other unfavourable hygienic conditions are prime factors in the production of deficiency diseases, especially rachitis; this belief received a great impetus in the publication of "Kassowitz" in which he put forth his famous

"domestication theory" as an ætiological factor of first importance in the production of deficiency disease in animals. Recklinghausen and others could not confirm his observation. Observations upon animals used by Funk in his experiments on nutrition showed them to be in better condition than others living amid better hygienic surroundings. They were found to be nearly double the size of normal animals, gave no signs of deficiency disease and their offspring were far superior in vitality and growth to those born to animals living under normal conditions. We do not advance this as an argument against proper hygiene in the care of our babies, for it is certain that had the animals lived amid better hygienic surroundings in addition to their high vitamine diet they would have done even better; what is really to be emphasized is the inadequacy of the theory of poor hygiene as the fundamental cause of the deficiency diseases. All of us have seen rickets amid the best hygienic surroundings and have failed to find it universal amid the very worst hygienic conditions. The same applies to all the other deficiency diseases. Other things being equal, however, hygiene undoubtedly plays its part in determining their progress and outcome, as it does in all other conditions and diseases with which we are concerned in our daily work.

Lastly we have the problem of the child with its likes and dislikes toward certain articles of food and the degree to which those who have the child in charge cater to its wishes. Let us take as our examples the children between the ages of two and four years for, after all, it is every man's experience that children affected, for instance, with rickets show improvement before the expiration of that period. The explanation is simple if we remember that about this time the diet is varied and includes many fresh foods, such as juices, fruits, fresh vegetables and the like, which if not overcooked are rich in active vitamines. These substances have, in such cases, again exerted their corrective influence, thereby bringing the metabolic standard up to its proper level. Many children, in spite of this, unfortunately, are permitted an excess of foods rendered poor in active vitamine by overheating; add to this excessive carbohydrate to tickle the palate, crackers, bread, sweets, etc., between meals, or in excess at meals, and we have fertile soil for the development of one or the other of the deficiency diseases. As the origin of a "vicious circle" we find an idle effort made on the part of their attendants, perhaps under professional advice, to offset the evident substandard development of the child by the addition of more of the "foods" just given as samples,

thereby not only spoiling their appetite for foods they should have, foods rich in active vitamins, but maintaining the very state of metabolic deficiency which they are attempting to combat. This furnishes us a reasonable explanation for the many cases of overfed weaklings and "substandards" that we see, and gives us at least a clue as to how to comfort the heart broken mother who gives her progeny "every care" and "the best of food" and yet fails to bring him up to the standard of the "neighbour's baby" who, by the way, "is not nearly so well taken care of." Cases of "persistent rickets" give us no more difficulties as to ætiology, and many hints as to treatment, if we remember the facts just presented.

A most important fact to note in relation to this discussion is that all of the deficiency diseases enumerated, as well as many allied conditions of similar origin overlap in their main symptoms. True, certain characteristic symptoms especially diagnostic of one or the other of the diseases just mentioned may stand out more prominently in that disease and so mislead one into the belief that no interrelation exists; but a careful study cannot fail to reveal an undeniable similarity of symptoms, taken as a whole, among apparently dissimilar conditions with correspondingly dissimilar names. All seem to find a common cause in some form of vitamin deficiency in the food. Furthermore, of paramount interest is the fact that each, if studied by means of the metabolism-bed shows a negative balance of the inorganic salts, such as calcium, magnesium, phosphorus, and sulphur. It is not the purpose of this paper to go into the minute symptomatology of each of these conditions at this time, as this has been done many times by others and is sufficiently familiar to all, but it may be of service for the purposes of this paper to point out an overlapping of symptoms in the diseases under consideration. Hæmorrhagic tendencies are most marked in scurvy, less marked in pellagra (though often present to such a degree as to present difficulties in different diagnosis) frequently seen in beri-beri, often seen in rachitis and osteomalacia and have been reported as occurring in cases of osteogenesis-imperfecta. Gastrointestinal symptoms are very common in pellagra, very common in scurvy, always present in beri-beri, and very frequently in rachitis. The nervous system is particularly vulnerable to all forms of deficiency disease. Whether it be a hyper-irritability, a spasticity, a peripheral neuritis, a central neuritis, or the manifestations take the form of convulsions, of pain or of palsy, they are present to a greater or lesser degree in

each and every one of this group of diseases. We need not individualize, but the most superficial comparison of the ordinary disturbances of the nervous system found in one, with those found in another, leave nothing lacking as far as similarity or analogy is concerned; whether the influence upon the nervous system be interpreted as direct or indirect it reverts to the metabolic deficiency as the basis of it all. Skin symptoms are common to all of these diseases either in the form of eczema, an urticaria, a dermatitis or purpura, or a combination of two or more of these eruptions may appear at the same time, or in sequence. Obviously no marked improvement will appear in the eruptions until the metabolic deficiency at the bottom of it has been dietetically corrected. Perhaps the successful practice of withdrawing or diminishing the sugar content in the diet of the eczematous child or one with spasm of some portion of the respiratory system with a rachitic basis, may find its explanation in the withdrawal of just so much carbohydrate as overwhelmed the amount of vitamines taken in the daily diet of the child. Chronic or acute changes in the skeleton, especially in the long bones, are too well known and so generally apparent in all of the deficiency diseases that neither space nor time need be given to their discussion here. Blood changes ranging from a simple anæmia of short duration to the very severest blood pictures lasting over long periods, perhaps through life, are common to all of the deficiency diseases depending upon their severity or duration. Changes in the ductless glands have been so marked in practically all of these diseases that reasonably enough the gland disturbance has often been looked upon as the ætiological factor in the disease in which it was affected. Perhaps it is the ductless glands upon which the unbalanced diet works its first havoc and then the abnormal secretion of the particular gland affected determines the nature of the deficiency disease which manifests itself. This is a matter for future research to decide. Vitamines may be substances out of which the ductless gland obtains some element necessary to the elaboration of its specific secretion. Lastly, and perhaps due to cases just cited, as speculative, we find in all classes of deficiency disease of one type and another, more or less marked hindrance to the normal growth and development of the entire organism, the degree being dependent upon the duration and previous intelligent efforts made towards a cure. This, after all, is the most important factor to be considered in the case of this class of disturbance.

We now come to the therapeutic principles underlying the management of these cases which also seem to substantiate the

writer's belief in their common origin and interrelation. Regarding scurvy there is but little to add to what is already known in relation to its successful treatment. We fully recognize the causative factors and have no further doubt as to the value of fresh extracts, especially fruit juices in the treatment. There never was any question as to the frank cases with typical symptomatology which were seen at five or six months, but the more recent researches have confirmed the already known facts that an early scurvy, characterized by a deficiency in growth and nutrition without other discernible symptoms, is very common and can be offset by the use of anti-scorbutics as early as in the first month of life. What are the anti-scorbutics? Vitamine containing substances possessing the same general chemico-physical properties as substances containing anti-beri-beri vitamine. Therapeutically and physiologically, in the light of our present knowledge of these substances there may be a difference between the various vitamines. For example, Hess claims no therapeutic result from the use of autolyzed yeast—a substance containing an enormous amount of the anti-beri-beri vitamine—in the treatment of his cases of scurvy. On the other hand, the author has found that autolyzed yeast has at times some anti-scorbutic and growth-promoting value if used in sufficient dosage. Recent animal experiments carried out by Funk show that, although the vitamine contained in fruit juices is far better adapted for the prophylactic or curative therapeutics of scurvy than the form contained in autolyzed yeast, still there is no doubt that the anti-beri-beri vitamine of autolyzed yeast has some effect as an anti-scorbutic, while fruit juices have some effect on the retardation of beri-beri in pigeons fed on polished rice for the usual length of time. It need not concern us, however, as to whether the vitamine of fruit juice or that of autolyzed yeast influences the condition towards a cure, nor whether a different vitamine is concerned in each case. Suffice it to say that such a substance or such substances are concerned in correcting the deficiency of metabolism known as scurvy. Passing on to the therapy of beri-beri, or what the writer believes to be an identical condition of milder degree "Mehlnahrschaden" in infants kept too long on cereal decoctions, we find a striking analogy in the prompt results obtained from the use of vitamine-containing substances; in these cases, however, the substances contained in autolyzed yeast seem to exert a better influence than that contained in fruit juices. More and more evidence is accumulating from day to day in support of the deficiency basis of pellagra, a condition

not as uncommon in children as may be supposed. The ætiology of this affection which seems to stand the test of experience the best was thoroughly worked out and described in Funk's book "Die Avitaminosen" and has more recently been verified by Goldberger's work.

We now come to the consideration of rickets and such allied conditions as osteogenesis-imperfecta and osteomalacia, for, after all, if we study the conditions under which the last two diseases appear, and also study their main symptoms, we find that the time of life at which they appear plays the main rôle in differentiating them as pathological entities. Osteogenesis-imperfecta is most active in the formative or foetal period, rickets is most common in the growing period, and osteomalacia in the adolescent or adult period when new functions or requirements are suddenly thrown upon the metabolism without proper precautions. All three at periods when a more active metabolism than merely vegetative becomes a necessity. Now, if we are willing to accept these last named conditions as deficiency diseases upon completely the same footing as we do scurvy, beri-beri and pellagra, we shall come far nearer an ultimate solution of the most complex problems which they may present than from any other standpoint. Furthermore, if we accept them as avitaminoses as Funk has suggested some years ago we will find ourselves still closer to a solution of the ætiology and, therefore, therapy of the condition. From the very earliest days since the recognition of rachitis as a pathological entity cod liver oil has been considered the most efficient remedy in the treatment of the disease. To this remedy were added the various adjuvants in the way of mineral salts, believing thereby to supply them for use to the tissues, failing, at the same time, to appreciate the fact that in the overwhelming majority of cases the tissues were receiving through the food an ample supply of these salts, but that the trouble lay in the fact that owing to some grave fault in the body economy they were not able to retain them. As time went on results obtained from cod liver oil were not as uniformly encouraging as the earlier reports seemed to indicate. Among the various explanations of this discrepancy of result none seems more rational to the writer than the probable destruction of vitamins as the result of the manifold processes of refinement to which cod liver oil has been more recently subjected. The crude oil has been proven by actual experiment upon the various animals to contain a very considerable proportion of an exceedingly active vitamin which vitamin is either partially

or totally inactivated by the various processes of refinement and has been demonstrated in some of the discarded fractions of the oil. Funk has shown that a fraction which he has isolated from the crude oil and which is in many cases absent in the highly refined oils is curative of beri-beri in pigeons and preventative of a condition identical with rachitis found in chicks. In judging the value of vitamine therapy in rachitis one must bear in mind that we are dealing with deficiency of metabolism very much more chronic than in the case of scurvy or beri-beri, and, therefore, the symptom complex is much slower in developing than in the other conditions mentioned; furthermore, in the cases of longer standing the anatomical mal-developments resulting from abnormal growth, as an aftermath of an undue proliferation with or without subsequent resorption of what would otherwise be normal cell or tissue constituents, produce deformities or weaknesses which only time can, to a greater or lesser degree, under favourable conditions, regulate by compensatory growth. Cases of rachitis in which tetany is present respond especially well to an increase in daily vitamine intake. Excessively cooked foods should be avoided. Vegetables should rarely be cooked over twenty minutes, and always served with the fluid in which they are cooked, to conserve the valuable vitamine containing substances as well as those inorganic salts soluble in the liquor. Disproportionate amounts of carbohydrate foods should be guarded against unless balanced by the presence of a sufficient quantity of other fresh foods. Maternal regulations are especially important in cases of breast fed babies where evidence of metabolic deficiency show themselves; in short, either a correct diet for the mother or else some form of vitamine, perhaps in the form of autolyzed yeast, may be directly administered to the nursling. In the case of artificially fed infants the early addition of vitamine containing substances and a very decided decrease of the amount of highly-milled overcooked starchy foods is to be recommended. The important vitamine of orange juice should never be neglected, even at one month, as a prophylactic against scurvy and perhaps even against rickets. Egg yolk, coddled, in gradually increasing doses beginning as early as the sixth month, if necessary, is an important vitamine containing substance often omitted on account of a possible anaphylaxis which some children have against egg albumin. There is no recorded case of anaphylaxis against egg yolk as far as the writer has been able to find out, either in his own experience or in that of others. If infants refuse the yolk pure, it may be combined with a cereal and no difficulty

will arise especially if we begin with a small amount. Large amounts of cereals should not be administered unless egg yolk or vegetable juices lightly cooked are administered at the same time. Beginning with the eighth or ninth month, to maintain a metabolic balance and to prevent a condition of which under-development as an example of rachitis is typical, the child should receive mixed purees of various vegetables properly blended with the addition of sufficient carbohydrate and fat to make a "balanced ration".

As a result of careful investigation as to the diet of mothers who have rachitic children, and especially those who have had other children who have had some form of deficiency disease, and furthermore, as to the diet of women during pregnancy, or during lactation, Stark, of New York, has come to the opinion that the tendency toward deficiency disease if not the disease itself, is inculcated "in utero". The negro and Italian in this country give us all the evidence necessary to give this theory a very sound basis to rest upon. We need not here go into the dietary of the negro and Italian; its peculiarities especially as to excessive carbohydrate constituents and excessive stewing with lack of fresh foods are familiar to any one caring to make a study of a series of these mothers and their babies. The varied results obtained in some of our larger foundling institutions and nurseries and even one's private experience with feeding formulæ find an explanation in this predisposition to deficiency disease on the part of some infants. One child will thrive beautifully on a diet which would give another rickets. Another child will gain half a pound a week on what apparently starves another of the same age. In the former, the child's economy is well within the safety zone of metabolic stability, as a result of a properly proportioned diet of the mother during pregnancy, and so furnishes enough vitamine from the full supply with which it was born to counterbalance an excess of carbohydrates in his formula, and his tissues grow and perform their functions. In the latter, the child has an unstable metabolic balance, owing to the improper selection of the maternal diet and therefore cannot supply the necessary vitamine from its own economy, since it has none to spare; the metabolism is upset, a negative balance of the inorganic salts results, valuable food constituents are not retained by the tissues, the child either develops a deficiency disease, or simply fails, and the more we "strengthen" its formula by adding carbohydrates (even if the other constituents are also added) we simply make things worse. The solution lies in adding a vitamine-containing substance.

This brings us to the next important consideration. In the absence of ideal conditions whereby sufficient active vitamine can be obtained from properly prepared fresh vegetables, eggs and the like, it remains for us to obtain a substance rich in active vitamine and at the same time stable and constant in efficiency.

In reviewing the literature on the use of yeast as a therapeutic measure we are led back to the very dawn of medical history. Schaumann was the first to show that brewer's yeast displays what was then called "antineuritic properties" for pigeons and other fowls fed on polished rice. He noted that this yeast was far richer in these properties than were other substances which he had investigated. Funk was able to show that the substance in question is of simple chemical nature since hydrolysis with acids strong enough to break down all the complex substances known in the nature resulted in the isolation of an active substance which he called "vitamine". Chamberlain, Vedder and Williams, and also Voegtlin and Towles went even a step further and ascertained that the hydrolysis yielded a more active preparation than a simple extraction of the yeast. Finally Cooper by leaving pressed yeast in an incubator for about thirty hours at body temperature obtained an hydrolysis by means of the inherent ferment present in the yeast cell similar to that produced otherwise by an extraneous acid as Funk had done. This constitutes what is known as the autolysis of yeast and the resulting product is known as autolyzed yeast. Owing to the enormously active metabolism of the yeast plant itself it contains perhaps the greatest amount of active vitamine per bulk of substance of any product thus far known. When filtered, the filtrate may be standardized as to vitamine content and, therefore, dosage by noting the average time it takes to cure a number of beri-beri pigeons when 0.10 c.c. is injected subcutaneously, as compared with the known time required by a standard vitamine preparation to produce the same result. We have, therefore, a standardized substance which, to be sure, has not been definitely determined upon as to maximum and minimum dosage, but which should possess special advantages for the pediatricist, not only in the care of his cases of deficiency diseases, especially rachitis, since that is not so common, but always in his management of stubborn feeding cases. With these facts in mind it might seem desirable at the present stage of our knowledge to administer this substance in selected cases in much the same way as we do fruit juices, that is to say, as a prophylactic against deficiency diseases in our difficult infant feeding cases,

instead of jumping about and modifying formulæ with no other hope than that "perhaps we might strike it right". The multiplicity of feeding systems now in vogue and changing with every man's opinion leaves us no doubt that the element of chance and the kindness of Mother Nature are two forces which make infant feeding an "art" rather than a "science", at least until we are willing to accept other substances than proteids, fats, carbohydrates and inorganic salts as essential to success along these lines. With the acceptance of the foregoing as a basis for further research and observation there seems little reason to doubt that a great step will have been made toward the better understanding of some difficult problems of infant feeding and also lead to a greater opportunity for the study of the principles which underlie the various deficiency diseases.

DR. ARTHUR C. NASH, of Vancouver, has been appointed resident physician and medical health officer at Masset, Queen Charlotte Islands.

Case Reports

CASE REPORTS OF KIDNEY SPECIMENS PRESENTED BEFORE THE MONTREAL MEDICO-CHIRURGICAL SOCIETY, MARCH 30th, 1917

BY DR. D. W. MACKENZIE

Royal Victoria Hospital, Montreal

THE first two specimens were congenital abnormalities from the autopsy room; the remainder from the operating room of the hospital (four of hydronephrosis and three tuberculous kidneys).

1. From a man, aged forty-two years, who had died of typhoid.

On the right side was a good-sized kidney above with a very small accessory kidney just below it, each having its own separate pelvis and ureter. Both ureters entered the bladder by two separate openings about $\frac{1}{2}$ cm. apart.

On the left side was an irregular bi-lobed degenerated kidney showing some fat displacement. It has two pelves, one from each extremity, and two separate ureters which join 4 cm. from the entrance to the bladder.

2. From a boy, fourteen years of age, who died of uræmia. The right kidney showed dystopia and hydronephrosis with pelvis irregularly attached and a short dilated ureter.

On the left side, placed much higher, was a small rudimentary kidney with distinct ureter extending down to the bladder. The left renal artery originated just about the iliac axis, the right left the aorta just at the iliac bifurcation.

3. A. P., aged sixteen, admitted December 28th, 1916, complaining of pain and swelling in the left loin. Condition began five years ago with an attack of pain (colic) in the left loin. In August, 1914, an exploratory nephrotomy was done.

Urine: Amber, slightly hazy, acid, 1021, faint trace albumin, sugar negative; pus, microscopically +.

Phthalin, 1 c.c. intramuscularly: Appearance time, eighteen minutes; first hour, 35 per cent., second hour, 12 per cent.

Cystoscopy: Right ureteral opening normal. Left œdematous and inflamed; catheter entered 4 cm., but no farther; no specimen through catheter, but scratch on wax-tipped catheter.

Findings—	Right	Left.
Macroscopically	Clear straw	No specimen.
Volume	2 c.c.	
Urea	2.2 per cent.	
Microscopically	No pus.	
Phthalin—1 c.c. intravenously—		
Appearance time	2 minutes.	
Amount in ten minutes.	12 per cent.	
In bladder at close—	Trace.	

Operative findings: Impacted calculi in ureter with infected hydronephrosis and perinephritic abscess.

4. O. P., aged fifty, admitted January 13th, 1917, discharged February 12th. Complaints were pain and tumour in the right side of the abdomen, which had begun eight years previously with sharp pain in the right loin. Urine is a dirty white and almost thick; general condition bad; emergency operation performed. The x-rays showed several shadows as low as the brim of the true pelvis.

Operative findings: A very large pyonephritic kidney with calculi.

5. T. D., aged twenty-two, admitted January 24th, discharged February 21st, 1917. Complaints, urethral discharge. This had begun in August, 1915, with indefinite pain in the left lumbar region, of short duration; several attacks since. Two weeks ago had an attack accompanied by hæmaturia and the Sunday before admission a mild attack of pain accompanied by urethral discharge. Thinks he had fever at times.

Urethral smear (methylene blue), showed many intracellular and extracellular cocci.

Culture from urethral discharge shows micrococcus urea, urethral diphtheroids, staphylococcus albus and bacillus coli.

Urine: Amber, with mucous shreds, 1017, alkaline; albumin and sugar negative; pus ++.

Phthalin: Appearance time, thirty minutes; first hour, 37 per cent.; second hour, 10 per cent.

Cystoscopy: Showed stricture of anterior urethra; both ureters easily catheterized; hydronephrosis of left side.

Findings—	Right	Left.
Macroscopically	Deep straw.	Pale, cloudy.
Volume.....	2 c.c.	14 c.c.
Urea.....	3 per cent.	Trace.
Microscopically.....	No pus.	Much pus.
Phthalin intravenously—		
Appearance time.....	2½ minutes.	11 minutes.
Amount in ten minutes.	14 per cent.	Trace.
In bladder at close—	None.	

Thorium pyelography: Dilated, irregular, pelvis.

Operative findings: Large pyonephritic kidney with stricture of left ureter near pelvis of kidney. Section of stricture showed no scar tissue.

6. C. P., aged fifty-one, admitted March 12th, discharged March 26th, 1917. Complaints were frequent and painful urination, which began with three or four days of hæmaturia, thirty years ago, at the age of twenty-one. Well for several years, then a mild attack at thirty-five. Operation for hæmorrhoids seven weeks ago, since then bladder symptoms more marked. Marked tenderness to pressure in right costo-lumbar angle.

Urine: Cloudy, straw-coloured, acid, 1018, albumin slight trace, no sugar; microscopically, epithelial cells with pus.

X-rays show shadow in right loin.

Cystoscopy: Bladder much inflamed; ureteral openings easily catheterized; left shows normal output, right, milk-like pus.

Operative findings: Large adherent calculus in pelvis with pyonephrosis.

7. P. M., aged fifty-one, admitted February 5th, 1917, discharged March 18th. Complaints were frequent painful urination for four years. Suprapubic cystotomy three years ago for tumour (?) of bladder.

Urine: Cloudy, dark, acid-pus ++++.

Phthalin: Appearance time, eleven minutes; first hour, 45 per cent., second hour, thirty per cent.

Cystoscopy: Instrument easily introduced; bladder much inflamed and contracted, no evidence of tumour. Left ureteral orifice large with thick pus emerging, right normal; both cathet-

erized. The right showed urine clear, amber, volume 2 c.c., 2 per cent. urea, and microscopically no pus. Urine from left, 10 c.c., whitish, thick, a trace of urea and microscopically pus in large amount.

X-ray: Left kidney pelvis injected with argyrol, showed large irregular cavity.

Operative findings: Advanced tuberculosis of kidney with mixed infection.

8. D. McN., aged thirty-nine, admitted January 24th, 1917, discharged February 20th. Complaints were pain in bladder with frequent urination. Began three years ago with aching pain in bladder.

Urine: Cloudy, amber, with shreds; acid, 1015; albumin, slight cloud; sugar negative. Microscopically, epithelial cells, many red blood cells and pus in large amount. Tubercle bacilli present.

Phthalin: Appearance time, fifteen minutes; first hour, 35 per cent., second hour, 22 per cent.

X-ray: Shows irregular shadows in region of left kidney.

Cystoscopy: Instrument easily introduced; mucous membrane of bladder much inflamed with ulceration at left side. Left ureteral orifice patent, could only persuade catheter to go 2 c.m. into left ureter; right easily to kidney. No specimen from left kidney. From right urine clear, straw-coloured, 1.6 per cent. urea, few with cells.

Indigo-carmin: 10 c.c. intravenously, appearance time on right side three minutes. Did not appear on left. Amount in ten minutes on right, good output. No indigo-carmin in bladder at close.

Operative findings: Small destroyed kidney, with calcareous deposits, advanced tuberculosis.

9. F. L., aged twenty, admitted January 14th, 1917, discharged February 10th. Pulse on admission, 124. Complaints were, hæmaturia for three days. First attack May, 1916; no history of injury; another attack in July; no history of colic. Present attack began three days ago, many clots passed; severe pain in bladder. No phthalin test as urine was bloody.

X-ray: Bladder filled with blood.

Cystoscopy: With difficulty bladder was partly emptied of clots. Mucous membrane fairly normal. The right ureter was

catheterized to pelvis of kidney, the left was œdematous with small clot which could not be displaced.

No specimen from left kidney. Urine from right was clear, straw-coloured, 1.8 per cent. urea and, microscopically, showed epithelial cells.

Phthalin, 1 c.c. intravenously. Appearance time, four minutes; amount in ten minutes, 12 per cent. on right.

Operative findings: Advanced tuberculosis of left kidney and ureter.

THE Metropolitan Life Insurance Company has recently completed a study of suicide as a cause of death among its industrial policyholders. The figures show that there has been a marked decrease in the number of suicides during the past few years, and that suicide is more than twice as frequent as a cause of death in males than in females. The most usual form of suicide in the case of males is by firearms, and in the case of females by poisoning. The number of suicides among negro males is a little more than half of those among white males.

Editorial

AN ANTITOXIN FOR GAS GANGRENE

IN the surgery of the present war there is perhaps no condition more terrible or tragic than that of gas gangrene. It is true that many cases have been saved by amputation, and even when the infection is not apparently virulent, by excision of the affected muscle or muscles, but such cures are rare when the infection is virulent, and are attained at great expense to the limb. Those who have worked much in France confess regularly that they have a horror of gas gangrene. It is likely that more men have died from gas gangrene in this war than from any other infection.

This being so, our interest must be particularly aroused by any work which gives promise of bringing an antidote to the poison of the Welch bacillus. An article by Carroll G. Bull and Ida W. Pritchett, which was published in the July number of the *Journal of Experimental Medicine*, appears to give this promise. Working with five strains of the Welch bacillus of which four were obtained from cases in France isolated by Dr. Simonds, and using chiefly pigeons, though also guinea pigs and rabbits, they were able to arrive at certain conclusions concerning the nature of the gas bacillus toxæmia, and, what is still more important, were able to make a protective serum.

The conclusions to which they came were briefly as follows: The infectious process is local in character, for few or no bacilli enter or are found in the general blood stream during life. The fluid culture (glucose broth) injected intravenously causes rapid death with great hæmolysis. If injected subcutaneously, or intramuscularly it causes in-

flaming and necrosing lesions. This is also true of the filtrate, although filtering lessens virulence. The lesions produced in the breast muscles of the pigeon, by injection of the filtrate, closely resemble those caused by infection with the bacilli.

Successive injections of carefully graded doses of this toxic filtrate in pigeons and rabbits give rise to active immunity. The blood taken from the immunized rabbits is capable of neutralizing the toxic filtrate *in vivo* and *in vitro*. The filtrate has, therefore, been designated as toxin and the immune serum as antitoxin.

The antitoxin neutralizes the toxin in multiple proportions. Hence the latter would seem to possess the properties of an exotoxin. Moreover, it neutralizes the hæmolytic as well as the locally injurious toxic constituent.

Such is the resumé of the article in the *Journal of Experimental Medicine*, but we now, in addition, have all the authority of a press clipping for the statement that the Rockefeller Institute is rapidly making this antitoxin, using large numbers of horses, and that "within three months the allied armies will be supplied with the serum". The newspaper correspondent has apparently access to more information than ourselves, still, we will not quarrel with that if only the serum proves effective under the conditions of the present war. It will, however, pretty certainly turn out that the extremely bad cases, so many of which come into our clearing hospitals, and even our base hospitals, after having lain out for twenty-four hours or longer, will not be saved by any serum. There will remain, on the other hand, many cases of mild or moderate grade in which the serum may very possibly have time to exert a good effect.

INSTEAD of the annual meeting which was to have been held at New Orleans, in December, a War Meeting will be held by the American Public Health Association, at Washington, D.C., on October 17th to 20th. Papers and con-

ferences will be devoted largely to problems created by the war, such as the food supply, communicable diseases among soldiers, war and venereal disease, war and the health of the civilian population.

WE publish in this issue an interesting article by Dr. Alan Brown, in which attention is directed to the important part played by vitamins in nutrition. The matter is perhaps of particular interest at this time when it is essential that every effort should be made to conserve our food supply and to use it to best advantage. The use of pure white, highly bolted flour, so much in favour on account of the whiteness of the bread it produces, is wasteful for two reasons: (a) because it lacks the nutritive qualities of the whole wheat flour, since during the process of manufacture the outer coverings of the wheat, which contain valuable mineral matter, and the germ of the wheat, which is rich in vitamins, have been discarded; and (b) whereas one hundred pounds of good average wheat will produce about ninety-nine pounds of whole wheat flour, the same quantity will produce only from sixty-five to seventy pounds of the finer white flour. This means that from four to eight million bushels of wheat could be saved in a year in this country alone were the whole wheat flour generally used. In discussing this question recently, Dr. Hastings, the medical officer of health of Toronto, drew attention also to the quantities of grain used in the manufacture of malt and spirits during the past year. He gave the following figures: *Employed in distilling*, 7,969,335 pounds of malt; 69,447,487 pounds of corn; 10,430,817 pounds of rye; 131,580 pounds of oats; 27,782 pounds of wheat; 27,416,716 pounds of molasses. *Employed in brewing*, 98,522,300 pounds of grain used for malting; 616,396 pounds of sugar and rice. Dr. Hastings stated that at the present time there are 20,000,000 gallons of spirits intended to be used for beverage purposes in bonded warehouses in this

country. The use of wheat in the distillation of alcohol, unless intended for manufacturing or munitions purposes, of course is forbidden by the recent order-in-council.

THE following resolution was passed at a joint meeting of the Edmonton Medical Academy and the Dental Association which took place at Edmonton, on June 27th last: "That in the opinion of this meeting of members of the Academy of Medicine and of the Edmonton Dental Society, assembled to discuss matters of public health, we deem the matter of the public health of the province of such importance that immediate steps should be taken to place the matter before every organization of influence in the province with the view of bringing such influence to bear upon the provincial government as will bring about the establishment of a Department of Public Health, believing as we do that only by the establishment of such a department can the urgent questions requiring attention be properly and adequately dealt with."

An educational committee has been appointed by these two bodies to organize a campaign of social reform. The committee is of the opinion that a good workable social or public insurance scheme would prove of invaluable assistance in reducing the number of cases requiring provincial or charitable assistance, and recommends that the same be put into operation at the earliest possible moment. It is also recommended by this committee that, as the only way in which the many urgent and pressing questions bearing on the public health can be dealt with properly and adequately, a department of public health be established which shall be under the direction of a competent deputy minister:

(a) To coöperate with the department of education in arranging the curriculum of schools to include more hygiene, and generally to carry out a more vigorous educational policy in regard to matters of public health;

(b) To arrange inspection of all school children by com-

petent inspectors, and in cases where the parent has not the necessary funds to pay for professional care, and provide that the same be done at the expense of the municipality in which the parent or guardian resides;

(c) For the coördination, systematizing and supervising of all work done by health officers in the various municipalities, including such work as is being done by the provincial board of health;

(d) To supervise the construction and maintenance of all hospitals, construction and maintenance to be done at the expense of municipalities;

(e) To supervise the construction and maintenance of all institutions for the care of those who for any reason have become a charge on or danger to the state;

(f) To supervise the care of all children under school age requiring assistance, including the employment of supervising nurses. "More children under five years of age have died within the British Empire since the war began than there have been men killed in the war";

(g) To grant marriage licenses;

(h) For the improvement of methods for dealing with tuberculosis and diseases largely connected with and contracted through vice;

(i) To arrange inspection of all public eating and rooming houses and to see that they are conducted with due hygienic precaution.

THE following is taken from the *Health Bulletin* issued by the Toronto Department of Public Health:

The attention of the Department of Health has been directed by the United States government to the fact that a variety of bean known as the Burmah White, or Rangoon bean, and labouring under the scientific name of "*Phaseolus lunatus*", has been sold in large quantities in the United States and Canada. This bean has been planted by the acre, and

in no case has it come up. Furthermore it is poisonous. Analysis of samples taken in Toronto and analyzed in our laboratory show it to contain .028 per cent. prussic acid, and cases are on record, in Holland for example, where people have died from eating it.

The Rangoon bean is a small, yellowish bean, with marked lines radiating from the small eye on the concave surface. These radiating lines and its yellow colour serve to distinguish it from the small white bean. Its importation has been recently stopped by the government as an injurious article of food.

We understand that this variety of bean has not been used by canners to be made into pork and beans, so that there would be no danger to fear from that source.

WE are able to confirm the announcement that, as the result of representations made by the Spanish government in Berlin, London, and Paris, the German government has agreed to a safe passage for hospital ships, on condition that a Spanish naval officer is on board and guarantees that the vessel is used only for the transport of sick and wounded. The French and British governments have agreed to the arrangement, and eleven Spanish naval officers, who will be posted to hospital ships under the agreement, left Madrid for the French ports about a week ago. The guarantee to be given by the Spanish officers will not involve any departure from the invariable practice of British hospital ships, although the German government has characteristically professed to believe the contrary.—*British Medical Journal*.

It is understood that Sir Alfred Keogh has in contemplation the establishment, in the office of the director-general of medical services in England, of a branch to deal with questions directly affecting territorial and temporary medical officers.

Such an arrangement would make it possible to collect and collate information upon the many problems that have arisen in connexion with the incorporation of numbers of civilian practitioners in the Army Medical Service, and to advise on the selection of officers for particular types of work for which they may be specially qualified.

MUCH difficulty has been experienced in regard to unexpired leases by physicians who have enlisted for active service. The lessor in many cases refusing to cancel the lease, the patriotic physician has found himself burdened with the rent of premises for which he has no use, since his business ceases automatically when he leaves, and an expense which he is frequently unable to sustain. As medical officers are needed so badly, every effort should be made to relieve them of obligations which might make it impossible for them to offer their services to their country. The Chicago Rotary Club, therefore, has taken up the matter and is desirous of obtaining definite information of cases in which landlords have refused to cancel leases held by physicians who wished to enlist. Such information should be sent to Mr. R. R. Denny, chairman of the committee entrusted with this work, care of the Denny Food Sales Company, Chicago, Illinois.

THE name of Advisory Committee on Venereal Disease for Military District No. 2, has been adopted by the committee recently appointed in Toronto to take steps to prevent the spread of such disease. A meeting of the committee took place on September 11th, when Major Fitzgerald was appointed president and Captain Gordon Bates the secretary.

Canadian Medical Association

THE MONTREAL MEETING

IN the last number of the JOURNAL we published a number of resolutions which were adopted at the June meeting of the Association. There still remain some others of importance which we are publishing herewith.

1. Moved by Dr. D. J. Gibb Wishart, seconded by Dr. R. E. McKechnie, and unanimously resolved,

That in the opinion of this meeting it is advisable that the whole medical profession in Canada be conscripted and be made available for the service of their country according to their various abilities in such work as may be deemed the most necessary; those who are fit and can be spared to be sent overseas; and those who are not fit, or are unsuitable, to be allotted such work as may be deemed in the best interest of their country.

It was further resolved that a copy of this resolution be forwarded to the Premier of Canada.

2. Moved by Dr. R. E. McKechnie, seconded by Dr. E. A. Braithwaite, and resolved that,

Whereas it has come to the knowledge of the Canadian Medical Association that the Victorian Order of Nurses is considering the project of the introduction of British midwives into Canada. Be it resolved that this Association protests against such action as being ill-advised and unnecessary. Not only can the situation—which is not very pressing—be better met by establishing small cottage hospitals under the charge of regular graduate nurses, but a grave injustice would be done to hundreds of our graduate nurses now at the front, who on their return to Canada would find many fields of usefulness occupied by a much less competent body of nurses.

Be it further resolved that a copy of this resolution be sent to the chief official of the Victorian Order at Ottawa.

3. Moved by Dr. R. E. McKechnie, seconded by Dr. D. Smith, and resolved that,

Whereas grain alcohol has long been extensively used in hospitals for various accessory external purposes, and

Whereas since the war its increased cost has resulted in the substitution of wood alcohol for the same purposes, and

Whereas it is proved that wood alcohol is a very violent poison, not only when ingested but also by inhalation and through the external surface, and

Whereas the increased cost of grain alcohol is in the main a matter entirely controlled by the government, therefore be it resolved,

That the Dominion government be requested to make special reductions in the duties on grain alcohol used exclusively for hospital purposes, so that institutions working solely for the public good may not be unduly burdened.

4. Moved by Dr. Helen MacMurchy, seconded by Dr. Campbell Meyers, and resolved,

That inasmuch as proper provision for the suitable training and permanent care of mentally defective persons is urgently needed, not only in the best interests of such persons and their families, but for the national welfare, the section of Medicine would therefore request the Executive Council to take whatever action they may deem advisable in this matter, such as appointing a special committee to report upon this subject at the next annual meeting of the Canadian Medical Association.

5. Moved by Dr. Bryce, seconded by Dr. Beaudry, and resolved,

That in view of the urgent requirements of public health, it is the opinion of the section on Public Health of the Canadian Medical Association that it is essential that the "Municipal Health Unit of Organization" be enlarged so that there may be appointed in the several provinces, all-time medical officers of health qualified in public health duties, who shall devote all their energies and time to the health interests of their communities.

6. In connexion with a paper by Dr. G. G. Copeland, of

Toronto, on Blindness in the Newborn, the following resolution was unanimously passed by the section of Obstetrics and Gynæcology.

Whereas it has been proven that a very large percentage of cases of blindness is due to infection acquired at birth, and whereas, at least 98 per cent. of such infections can be inhibited at their outset by simple means, it is hereby resolved, that the members of the section of Obstetrics and Gynæcology of the Canadian Medical Association, now in session, request the Executive Committee to take such active steps as may tend to suppress this crying evil in the community, and beg to suggest that an influential committee be appointed to consider the whole question, and that such committee be empowered to approach the Federal and Provincial authorities with a view to the introduction of suitable prophylactic legislation.

FINANCIAL STATEMENT FOR 1916

For the information of our members the auditors' report for the financial year ending December 31st, 1916, is here published. Comparison with last year's report will show considerable improvement in the financial condition of the Association. The cash surplus at the end of 1915 was only \$32.82, whereas at the end of 1916 our statement shows a surplus of \$719.84. From this, however, should be deducted the sum of \$220.00, the amount of the refund due the Ontario Medical Association in 1916, and which should have been paid before the end of that year. The total surplus at the end of last year was therefore \$499.84.

It will be further noted that there is a decrease in the total amount of subscriptions collected, this, of course, being accounted for largely by the number of our members who have gone overseas. In connexion with the decrease in subscriptions we should inform our members that the Executive Council at a special meeting held during 1916, decided that for members who are on active service overseas the subscription fee should be reduced to \$2.00.

AUDITORS' STATEMENT

The Chairman of Finance Committee,
Canadian Medical Association,
Montreal.

Dear Sir,—

We beg to report that we have completed an audit of the

Association's books and accounts for the year ending 31st December, 1916.

The attached statement shows cash receipts and disbursements for the period.

A surplus of \$719.84 is carried forward as compared with \$32.82 for the year 1915.

Subscriptions due for 1916, which have been collected since the closing of the books, amount to \$81.00.

We found the books in excellent order. Your cash account has been reconciled with the bank book and proper receipts and vouchers were on hand for all disbursements. Our requirements as auditors have been fully satisfied.

Yours faithfully,

E. B. SAVAGE & Co.

Montreal, 3rd May, 1917.

CASH RECEIPTS AND DISBURSEMENTS, YEAR ENDING DECEMBER 31ST, 1916

<i>Receipts</i>		
Balance in Bank January 1st, 1916.....		\$32.82
Annual fees paid direct.....	\$1,263.63	
Annual fees paid by draft.....	3,772.05	
Annual fees paid at Ontario Medical Association.....	409.60	
	<hr/>	5,445.28
Reprints.....		328.85
Bank rebates.....		.90
		<hr/>
		\$5,807.85
 <i>Disbursements</i>		
Editorial secretary's salary.....		\$600.00
Refunds paid Provincial Societies—		
New Brunswick.....	\$45.50	
Alberta.....	44.50	
Nova Scotia.....	42.50	
Saskatchewan.....	27.00	
Manitoba.....	58.00	
British Columbia.....	33.00	
	<hr/>	250.50
JOURNAL Account—		
Renewal subscriptions.....	\$2,178.00	
New subscriptions.....	288.00	
Sundries.....	41.93	
	<hr/>	2,507.93
Reprints (Murray Printing Co.).....		332.33
Clippings.....		48.00
Montreal Medical Journal Co.		
Payment to stockholders, \$5,000 at 6 per cent..		300.00

General Expenses—

Salary, stenographer.....	\$730.00	
Postage and sundries.....	120.00	
Stationary.....	89.90	
Travelling expenses: Toronto.....	56.60	
Audit fees.....	20.00	
Sundries.....	32.75	
		<hr/>
		\$1,049.25
Balance in bank.....		719.84
		<hr/>
		\$5,807.85

Certified correct,

E. B. SAVAGE & Co.,

Chartered Accountants.

Montreal, May 3rd, 1917.

Correspondence

Toronto, August 21st, 1917

The Editor,

THE CANADIAN MEDICAL ASSOCIATION.

Sir,—

I note with satisfaction your article in the current number of the JOURNAL upon the Venereal Disease problem, particularly that portion in which you deal with the matter of the production of remedies for the cure of syphilis, with free diagnosis and treatment, and with quack practice and advertising of quack remedies.

You will be interested in knowing that the Provincial Board of Health made application last June to the Commissioner of Patents for a license to prepare a substitute for salvarsan, under the German patents. This application was most vigorously, and for the time being, successfully opposed by the Synthetic Drug Company, and Dr. Archambault, of Montreal, the present licensees. Although it was shown to the Commissioner that the facilities of the Board in the way of plant, etc., would obviously reduce the present excessive retail price (\$2.50 per 0.6 gramme, which is 100 per cent. above the wholesale price), the application was refused. However, a strong protest is being entered against this decision and the Board relies upon the medical press and profession

for support in securing in respect to these remedies, the same successful results which have been attained in regard to the various vaccines and antitoxins now supplied free by the Board and made available at about cost price to the whole of Canada.

The Synthetic Drug Company, while disclaiming that they control the retail price of diarsenol, can scarcely successfully maintain such denial in the face of the fact that, when one seeks to purchase this article one is confronted by the printed card of the company detailing the retail price already referred to.

I might mention, with reference to the Academy resolutions, that the Board has already in operation a strong propaganda of education and that laboratories for the free diagnosis of venereal diseases are now in operation at Kingston, London and Toronto. The question of free treatment will have to wait until we can obtain a cheaper means of treatment.

Legislation should certainly be secured to control quack practice and advertising.

The Board is fully alive to the need of vigorous action in respect to this problem and is prepared to advance as rapidly as public opinion will support it.

I have the honour to be, Sir,

Your obedient servant,

J. W. S. McCULLOUGH,

Chief Officer of Health.

Book Reviews

EXPERIMENTAL PHARMACOLOGY. By DENNIS E. JACKSON, Ph.D., M.D., associate professor of pharmacology, Washington University Medical School, St. Louis, with 390 original illustrations, including twenty-four full page colour plates. St. Louis, C. V. Mosby Company, 1917.

This is a very excellent manual which should be in the hands of every student of experimental pharmacology—and we may add of experimental physiology. The text is excellent, giving exact

specific and detailed directions for carrying out almost all the experiments which the student will be called upon to perform in the study of this very important subject. The book itself with its excellent paper, beautiful type, and wealth of illustration, reflects the highest credit upon its publishers. We strongly recommend it to all our students.

HANDBOOK OF SUGGESTIVE THERAPEUTICS, APPLIED HYPNOTISM, PSYCHIC SCIENCE. A manual of practical psychotherapy, designed especially for the practitioner of medicine, surgery and dentistry, by HENRY S. MUNRO, M.D., Fourth edition, revised and enlarged. St. Louis, C. V. Mosby Company, 1917.

This book, now in its fourth edition, has been written to emphasize the value of suggestive therapeutics to the general practitioner, and embodies what the author has found to be useful in his own practice after a careful study of what has been written on the subject, and after many years of practical experience. Of the value of psychotherapy the writer is confident. In this volume he has endeavoured to place the basic principles of physiological psychology before the profession in such a manner as to be easily grasped and assimilated; by presenting the scientific as well as the practical side of psychotherapy to his readers. Quoting a remark made by Professor Barker of Johns Hopkins Hospital, "Modern medicine is striving towards rational psychic diagnosis and rational psychotherapy," he claims that in many affections an inquiry into the psychic state of our patient is more important than the actual somatic inquiry. He considers that in all classes of disease psychotherapy finds an important field of application as by its means we can make a direct impression upon the brain and through it increase the functional activity of every cell in the human body. Among the more important chapters in the book are those on—Scientific basis of psychotherapy; practical theoretical considerations; psychotherapeutic value of suggestion; psychotherapy in obstetrics; psychoanalysis in the treatment of the psychoneuroses.

The book is written in a pleasant style which makes it easy reading. While we hesitate to accept every statement of the author, who is an enthusiast, we recognize the book as eminently practical and well worthy the perusal of every physician who desires to make use of this valuable therapeutic adjunct.

THE DISEASES OF INFANCY AND CHILDHOOD. For the use of students and practitioners of medicine. By L. EMMETT HOLT, M.D., Sc.D., LL.D., professor of diseases of children in the College of Physicians and Surgeons (Columbia University), New York; and JOHN HOWLAND, A.M., M.D., professor of pediatrics in the Johns Hopkins University, Baltimore. Seventh edition, fully revised. 1,161 pages with 215 illustrations. Publishers: D. Appleton & Company, New York and London, 1916. Price, \$6.00.

Dr. Holt's treatise on diseases of infancy and childhood has been for the past twenty years regarded as our leading text-book on this subject; we may almost add as the leading text-book in the English language. Five years have elapsed since the last revision. Since then he has joined with himself as co-editor, Dr. John Howland, pediatricist-in-chief to the Johns Hopkins Hospital. The present revision has been a very thorough one and owing to the high standing of both the editors the volume will maintain its high place among the many text-books on this subject. Few medical text-books are so pleasantly written and few present their facts in such a lucid manner as this, and are at the same time so eminently practical. In this edition we have read with much interest and profit the new chapters on acidosis, neuropathic and exudative diathesis; idiosyncrasies to foodstuffs; cardiac arrhythmia; Banti's disease; pellagra; and syphilis of the nervous system. Many chapters have been entirely re-written, of which the more important are those on digestion in infancy; asthma; accidental heart murmurs; poliomyelitis; diseases of ductless glands, and diabetes. Many new illustrations have been added. To the student and to the physician in practice we have much confidence and pleasure in strongly recommending this last edition of Holt's text-book as one of the ablest presentations of the diseases of infancy and childhood at present before the public.

Obituary

GEORGE RAYMOND McDONAGH, M.D.

THE death of Dr. McDonagh occurred at Toronto, on August 26th, in the sixty-second year of his age. Born in 1856, at Carlow, in the province of Ontario, George Raymond McDonagh was educated at the Goderich Grammar School, and at Upper Canada College, from which he went to Toronto University, where he graduated in medicine, in 1876, at the early age of twenty-one. Dr. McDonagh went into practice at Brussels, in partnership with Dr. Graham for a time, and then went to London and Edinburgh to do post-graduate work. Upon his return to Canada he went into practice at Goderich, but a couple of years later returned to Europe and went to Vienna, where he made a special study of diseases of the ear, nose, and throat, to which he subsequently devoted himself. Since his return he had practised in Toronto. He was appointed professor of oto-laryngology in the University of Toronto in 1903. Dr. McDonagh was particularly fond of travel and for the last ten years had been in the habit of spending his winters abroad. He was unmarried.

DR. JEROME J. MURPHY, of Wawota, Saskatchewan, died at the Moosomin General Hospital, on August 26th, after a short illness. Dr. Murphy was a graduate of Edinburgh University, of the year 1896, and had been in practice in Saskatchewan for about six years.

News

MARITIME PROVINCES

It is the intention to increase the accommodation of the Camp Hill Military Hospital at Halifax, by the addition of two new wings. It will then have a capacity of 600 beds. A separate building has been provided for vocational training.

ONTARIO

THE new wing that has been added to the Weston Sanatorium and the William Davies Cottage for Babies were formally opened by His Excellency the Duke of Devonshire on August 29th last. It was announced on this occasion by Mr. McPherson that it was the intention of the government to establish a six hundred bed sanatorium for soldiers suffering from tuberculosis within a few months and that the institution, when no longer required for the use of military patients, would be used for the treatment of consumptive patients from the hospitals for the insane and similar institutions in the province.

THIRTY-SIX cases of infantile paralysis were reported in the province during the month of August; death occurred in three of the cases. Other cases of infectious disease reported were: Tuberculosis, 174 cases, 66 deaths; smallpox, 16 cases; scarlet fever, 67 cases, 2 deaths; diphtheria, 227 cases, 17 deaths; measles, 114 cases, 1 death; whooping cough, 209 cases, 6 deaths; typhoid fever, 71 cases, 11 deaths; cerebro-spinal meningitis, 5 cases, 4 deaths.

QUEBEC

IN accordance with the present by-laws and the legal opinion recently expressed by the city attorney, all building plans in the city of Montreal in future must be submitted to Dr. Boucher, the medical officer of health, as well as to the city architect.

BRITISH COLUMBIA

THE formal opening of the military annex of the Vancouver General Hospital took place on September 5th. The building contains accommodation for three hundred patients, the wards, eight in number, each containing from thirty-four to forty beds.

MEDICAL COLLEGES

McGill University

THE honour of a Knight Commandership of the Order of the Bath has been conferred by His Majesty the King upon Brevet Lieutenant-Colonel (temporary Brigadier-General) Auckland Camp-

bell Geddes, C.B., M.D., director of recruiting in England, in recognition of valuable services rendered in connexion with the war. Sir A. C. Geddes had occupied the chair of anatomy in McGill University for a year when the war broke out. He at once turned to good account his knowledge of military organization and his previous experience during the South African war and at the Universities of Edinburgh and Dublin, where he had been responsible for the institution and organization of the officers' training corps, and under his able direction the McGill Battalion was formed in the early days of the war. Within a few months, however, he was recalled to England. Since then he has held many posts of responsibility and is now the director of recruiting, with the military rank of brigadier-general. Sir A. C. Geddes is the brother of Sir Eric Geddes, First Lord of the Admiralty.

ARMY MEDICAL SERVICES

THE Military Cross has been awarded to the following officers:

CAPTAIN (TEMPORARY MAJOR) RONALD HUGH MACDONALD, C.A.M.C., of Winnipeg. "For conspicuous gallantry and devotion to duty. One of our aeroplanes was shot down, the observer was wounded and pinned beneath the wreck. This officer and a bearer went out in full view of the enemy, who were shelling the machine, and extricated the wounded man and removed him to safety. He himself was severely wounded while doing so."

CAPTAIN ROBERT JAMES MANION, C.A.M.C., of Fort William. "For conspicuous gallantry and devotion to duty. While going forward through a heavy hostile barrage to establish an aid post, he, at great personal risk, stopped and dressed alone nine wounded men."

CAPTAIN ARCHIBALD MCCausLAND,* C.A.M.C. "For conspicuous gallantry and devotion to duty. At great personal risk he crawled through a small opening into a dug-out which had been blown in by hostile shell-fire, dressed the men there, and afterwards attended to all the wounded in the locality, under continuous heavy shell-fire. His courageous action saved the lives of several wounded men."

CAPTAIN ASHLEY COOPER JOHNSTON, C.A.M.C., of Cowley, Alberta.

* Captain McCausland's name was published in our last issue but we have since learned the particulars given above.

CAPTAIN FRANK L. MCKINNON, B.A., M.D., of Winnipeg. "For conspicuous bravery shown in the carrying out of duties in connexion with the Royal Army Medical Corps."

CAPTAIN CHARLES GOLDIE SUTHERLAND, C.A.M.C., of Albany, New York.

CAPTAIN GRAHAM R. ROSS, C.A.M.C., of Montreal.

CAPTAIN GORDON ARCHIBALD MACPHERSON, C.A.M.C. "For conspicuous gallantry and devotion to duty in collecting and tending the wounded under heavy shell-fire. His promptness and devotion in collecting stretcher cases in dug-outs where it was impossible to evacuate them at once undoubtedly saved many lives."

CAPTAIN ANDREW HARVEY CAMERON SMITH, C.A.M.C. "For conspicuous gallantry and devotion to duty. Following his battalion closely in its attack, he displayed the greatest courage and skill in establishing aid-posts at the nearest possible points, regardless of his own personal safety. Though his posts were frequently under heavy shell-fire, the completeness of his medical arrangements, and the quickness with which aid was available, proved invaluable to the wounded. His work at all times has been marked by the same devotion and gallantry."

CAPTAIN JOHN ERNEST AFFLECK, C.A.M.C. "For conspicuous gallantry and devotion to duty. He crawled along a trench to a severely wounded officer whose life depended upon an immediate operation. He got the wounded man on a blanket. It was a very slow and dangerous task, being completely exposed to snipers. Captain Affleck did not hesitate to risk his own life to do all humanly possible for this officer." When the McGill University Hospital was mobilized Captain Affleck was studying medicine at McGill. He joined the unit and accompanied it to the front, where he spent some months as an orderly. He then returned to Montreal to finish his medical studies and graduated in the spring of 1916. He was given a commission in the Canadian Army Medical Corps and after training for a few months at Valcartier, returned to France as medical officer of an infantry battalion.

TEMPORARY LIEUTENANT ROBERT BEATTIE MARTIN, R.A.M.C. "For conspicuous gallantry and devotion to duty. He showed the greatest gallantry in attending to the wounded under very heavy fire at a moment when the enemy had turned machine guns on to them. He displayed the utmost fearlessness and skill in getting most of them away into a place of safety."

The following appointments in the Canadian Army Medical Service have been gazetted:

Deputy Director of Medical Services: Temporary Colonel Murray MacLaren, C.M.G., C.A.M.C.

Assistant Director of Medical Services: Temporary Lieutenant-Colonel C. E. Doherty, C.A.M.C.

Deputy Assistant Directors of Medical Services: Temporary Major J. S. Jenkins, D.S.O., C.A.M.C., and temporary Captain H. B. Logie, C.A.M.C.

THE Royal Red Cross of the second class has been awarded by His Majesty to Nursing Sisters EMMA F. PENSE, of Kingston, Ontario, and FLORA H. WYLIE, of St. Catharines, Ontario.

THE French Cross of War has been conferred upon Nursing Sister MADELINE F. JAFFRAY, of Philadelphia, Pennsylvania.

MAJOR SAMUEL H. MCCOY, C.A.M.C., of St. Catharines, Ontario, has been recommended for the D.S.O.

THE undermentioned officers of the Canadian Army Medical Corps have been brought to the notice of the Secretary of State for War for valuable services rendered in connexion with the war:

LIEUTENANT-COLONEL J. A. AMYOT.

LIEUTENANT-COLONEL G. E. ARMSTRONG.

CAPTAIN A. B. CHANDLER.

LIEUTENANT-COLONEL J. T. CLARKE.

LIEUTENANT-COLONEL W. H. DELANEY.

LIEUTENANT-COLONEL D. DONALD.

CAPTAIN W. J. ENRIGHT.

LIEUTENANT-COLONEL C. H. GILMOUR.

LIEUTENANT-COLONEL P. G. GOLDSMITH.

CAPTAIN T. F. GRAHAM.

CAPTAIN H. C. HALL.

LIEUTENANT-COLONEL J. MCCOMBE.

MAJOR S. H. MCCOY.

CAPTAIN W. B. MACDERMOTT.

LIEUTENANT-COLONEL H. E. MUNROE.

LIEUTENANT-COLONEL R. RAIKES.

LIEUTENANT-COLONEL H. M. ROBERTSON.

COLONEL R. D. RUDOLF.

LIEUTENANT-COLONEL C. L. STARR.

MAJOR R. E. WODEHOUSE.

AMONG recent promotions in the Canadian Army Medical Corps are the following: To be temporary Lieutenant-Colonels: Major C. H. Dickson and temporary Major E. L. Stone. To be acting Lieutenant-Colonel while in command of stationary hospital: Temporary Major H. E. Kendall. To be Majors: Captain J. G. Johnson and Captain R. N. Sutherland, and temporary Captains W. Creighton, E. S. Jeffrey and D. J. Cochrane. To be temporary Captains: J. W. Dickson, G. F. Laing and J. Patterson.

MAJOR J. G. JOHNSON is senior surgeon and MAJOR R. N. SUTHERLAND is senior medical officer to No. 1 Canadian Stationary Hospital in Salonica, under the command of Lieutenant-Colonel E. J. Williams, C.A.M.C.

CAPTAIN A. P. CHOWN, C.A.M.C., is in charge of the Canadian Central Depot medical stores, at 12 Pulteny Street, London.

LIEUTENANT-COLONEL DAVID K. SMITH, who has been on duty at Salonica with the Toronto University Hospital, has returned to Toronto suffering from a recurrence of malarial fever contracted in Greece.

CAPTAIN O. C. J. WITHROW, C.A.M.C., of Toronto, has been appointed medical officer of the Military Hospital that has been opened at Newmarket.

LIEUTENANT-COLONEL T. C. BEDELL, C.A.M.C., is acting officer commanding the Canadian Convalescent Hospital, at Epsom, during the absence on leave of Lieutenant-Colonel Irving, C.A.M.C.

DR. THOMAS B. FUTCHER, associate professor of clinical medicine at Johns Hopkins Hospital, has received a commission in the Canadian Army Medical Corps and has left for England, where he will assume command of a Canadian military hospital. Dr. Thomas McCrae, who has been in command of this hospital, has returned to Philadelphia. Dr. Futcher, who like Dr. McCrae, is a Canadian by birth, graduated from the University of Toronto in 1893.

LIEUTENANT-COLONEL GEORGE BOURGEOIS, C.A.M.C., is on duty at the Saint-Cloud Hospital. Lieutenant-Colonel Bourgeois left Montreal in command of the Laval Military Hospital.

MAJOR CHARLES SAINT PIERRE, C.A.M.C., is attached to the Laval Hospital, at Troyes, France.

THERE are about three hundred patients now in the North Toronto Military Orthopædic Hospital. The officer in command is Lieutenant-Colonel W. E. Gallie, C.A.M.C. The hospital building was intended originally for the Salvation Army, but was taken over by the Military Hospitals Commission last October. Two wings have since been added, each providing accommodation for one hundred and fifty patients. A factory for the manufacture of artificial limbs has also been built and a vocational training building is now in process of construction.

CASUALTIES

Wounded

CAPTAIN ROBERT INKERMANN HARRIS, M.C., R.A.M.C.

CAPTAIN WILLIAM J. KNIGHT, M.C., R.A.M.C., of Guelph, Ontario.

CAPTAIN JAMES MOORE, C.A.M.C., of Brooklin, Ontario, medical officer of the 116th Battalion.

CAPTAIN OSWALD J. DAY, M.C., R.A.M.C., of Toronto, East Surrey Regiment. Captain Day was decorated with the Military Cross in June "for conspicuous gallantry and devotion to duty."

Medical Societies

MONTREAL MEDICO-CHIRURGICAL SOCIETY

THE thirteenth regular meeting of the Society was held Friday, March 30th, 1917, Dr. W. S. Morrow, president, in the chair.

LIVING CASE: Tuberculous râles, by Dr. E. S. Harding.

In bringing this case before the Society I would like first to touch a little on the history of the condition presented. The first case presenting these râles came to me as a private patient in 1911. There was a history of cough extending over years, which had been much worse during the previous fall and winter; no expectoration; no hæmorrhages. Typhoid at the age of fourteen. One brother died of tuberculosis. On examination over the left interscapular space I detected a rather fine expiratory râle, more in the nature of a little wheeze or sibilant râle (like the soufflé sometimes heard over the left chest with the beat of the heart). This was not synchronous with the heart beat and was only expiratory. I marked it at the time as being like a pleuritic râle. There was practically nothing else in the chest to draw one's attention to a condition of tuberculosis. I saw her again in the middle of the

summer when she was complaining of a great deal of pain over that region with the cough still persisting; loss of weight, from ninety-eight to eighty-six pounds. On July 19th her condition was practically the same, except an increase of the râles spreading a little towards the base of the left lung. The scapular region here was very tender to the touch and the left interscapular space extremely sensitive. I tried both internal and external remedies and the patient spent most of that summer in the mountains with no improvement. On August 7th and September 7th examination showed the condition the same. In October I gave her a tuberculin test with about the sharpest reaction I had ever seen. The condition continuing, I put her on tuberculin which she took practically all winter once a week with marked amelioration of her symptoms, the pain subsiding a great deal. Two years ago I again saw the patient and she said she was in pretty good health but she did not want to be examined again, fearing to be told she still had tuberculosis. The râle when I last examined her was practically the same, quite as persistent, occupying the same space in the interscapular region on the left side.

The second case was a man who complained of pain in the left chest. His wife recently died from tuberculosis and becoming alarmed at the pain he consulted me. On examination I found an expiratory râle something the same as in the last case, over the left chest, about the third rib to the axilla. It was not nearly so marked but was of slightly longer duration and not so persistent. The pain was all he complained of. I gave him a tuberculin test and he reacted quite sharply. I saw him a year later and the condition was practically the same except that the pain was not quite so marked. He had no treatment and I have not seen him since.

The present case was recommended to me by Dr. Hepburn, in August, 1915. He had typhoid fever six years previously and since that time more or less persistent cough. At the time of examination he had slight morning cough with expectoration, slight hæmoptysis, night sweats, and distress on walking. Normal weight one hundred and sixty pounds, present weight one hundred and forty-eight pounds and a half. Examination showed slight depression of the right apex with impaired sounds on percussion and a few coarse râles outside the heart. On August 1st, I gave him a tuberculin test, which reacted to 101.1 on the third dose. On examination after that test the expiratory râles were heard in the right subclavicular region. He was put on tuberculin and allowed to continue work. During the course of tuberculin there were several reactions, one of them fairly severe. He finished his last

dose in April, 1916, and his weight had returned to one hundred and sixty and a half pounds. He was still working. Examination at that time still showed the expiratory râles, otherwise was practically negative. He has been working ever since and in good health. He complains of pain over the region that was first affected, the right subclavicular region, and the peculiar part of it is that after the pain disappears the flesh on that side of the chest is sensitive. The x-ray plate of the present patient shows only a little extra thickening over the area involved and no marked glandular enlargement.

These three cases each showed the same wheeze or sibilant dry expiratory râle localized to one particular part of the chest, very persistent, extending over months or years. In each case there was a history of sharp pain in the locality affected, and in two of the cases the skin was sensitive. Each case reacted sharply to tuberculin. Two out of the three cases responded well to tuberculin treatment.

PATHOLOGICAL SPECIMENS: Series of kidneys, by Dr. D. W. MacKenzie.

Two specimens of congenitally abnormal kidneys, four of hydronephrosis and three of tuberculosis. These were illustrated by x-ray plates. A full description of these specimens, together with their clinical histories appears on page 925 of this number of the JOURNAL.

DISCUSSION: Dry F. M. Fry: Although it was not mentioned I presume that the cases of renal tuberculosis were unilateral. In children renal tuberculosis is fortunately almost always unilateral.

Dr. M. Lauterman: Dr. MacKenzie is to be congratulated on having such an interesting series of cases to bring before us, the striking thing in this series to me is the fact that these patients all had trouble for some considerable time before coming under his observation, which was probably the first time that a complete urological examination had been made in each instance. In my modest way I have been preaching and pleading for thorough examination in this department, from the floor of this Society for some years past.

In one of his cases Dr. MacKenzie referred to a stricture of the ureter as being of congenital origin. In reciting the history he spoke of the patients having had nephrolithiasis followed by infection. Would it not be more likely that the stricture followed this traumatism and infection?

A very important point referred to by Dr. MacKenzie was that of the urea output in the absence of practically any phthalein

output. This is interesting from the fact that the kidney will continue to function until it is completely destroyed; unfortunately this does not assist us very much in deciding when it is safe to operate in any given case, it does, however, prove that a kidney can still eliminate urea even though it can only, so to speak, gasp. Another interesting and important point mentioned was the fact that these patients at first rarely present any distinctive or localizing symptoms, so that a complete urological examination is the only means whereby one can determine, early, whether that patient has a renal calculus, an obstructed ureter, or a tuberculous kidney.

Dr. D. W. MacKenzie: In the three tuberculous kidneys we had two with no evidence of lesion of the other side, but the third, the small contracted kidney, did show some pus coming from the other side. With regard to the phthalein output we have found that we often get a very low output when the kidney lesion is very small and very early; later it increases as the kidney begins to right itself, then diminishes when the kidney is being destroyed. With regard to the case Dr. Lauterman mentioned, we thought that was probably due to a stone in the past, but section does not show any marked inflammatory reaction and the stricture appears to be more or less of a congenital nature.

PAPERS: 1. Gonorrhoeal urethritis, its diagnosis and treatment, by Dr. E. J. Daly.

DISCUSSION: Dr. M. Lauterman: I am sure this paper has been exceedingly interesting to all of us, the average man is not in practise very long before he has occasion to think of one or other phase or condition developing as a result of this disease. The writer has brought out several points of very great importance during the reading of his paper; the differential diagnosis between true gonorrhoea and simple non-specific urethritis, is one the importance of which cannot be overestimated. Like many others I can look back on instances in which I took it for granted that a patient suffering from a urethral discharge had gonorrhoea, and I agree that a culture carefully made is the only certain means at our command to enable us to make a correct diagnosis.

If I may be permitted to differ on a few minor points, I should like to say that I cannot, for instance, agree that there is always a greenish-yellow discharge on the third or fourth day. I have seen cases repeatedly in which there was only the slightest moisture at the meatus, and yet intracellular gram-negative cocci were found to be present. I take exception also to the statement that the bladder is never involved. I have had at least two cases in which it was distinctly involved, one coming to post mortem in

which an ascending gonorrhœal pyelitis involving the renal pelvis was present. The literature also contains reports of several similar cases.

I have not been as fortunate as Dr. Daly in the treatment of gonorrhœa epididymitis. I have followed the treatment that he suggests, but have by no means had recoveries in forty-eight hours. I have been more successful with Hanger's method, puncturing the epididymis either with a small Græffe knife or a large triangle needle and following this operation by the use of hot applications. The pain subsides in a very few hours, and recovery with a functionally useful testicle is as a rule very rapid; the drop or two of pus liberated by the puncture drains into the scrotum and is I believe absorbed. I have never seen any bad effect follow this simple operation.

Dr. Daly's remarks on the subject of stricture are very much to the point. I quite agree with him that in the great majority of instances it is possible to dilate satisfactorily. Internal urethrotomy, in my experience, is rarely necessary and external urethrotomy scarcely ever called for. Personally I much prefer the Kollman dilator to the sounds usually employed; in experienced hands its use is painless; the dilatation is effected at the point of contraction and can be gradually increased as may be necessary without changing the instrument.

I am sorry that Dr. Daly did not discuss more fully the question of when he considers a case of gonorrhœa cured. This, in my opinion, is a matter of considerable importance, not only as regards the patient himself, but also as regards his wife, either prospective or actual. The work of Schwartz and McNeill in connexion with the complement fixation test for residual gonorrhœa, has thrown considerable light on this subject.

Dr. F. R. England: I have been interested in and appreciate very much Dr. Daly's most excellent and lucid paper. He has dealt with a very important subject, for certainly gonorrhœa is one of the most important infections with which the physician and surgeon has to deal. Regarding the question of diagnosis: Ricord, the great French surgeon, said years ago, "Almost any man knows when he has the clap but God alone knows when he will get over it." The great majority of cases of urethritis are certainly due to the gonococcus of Neisser. The point which impressed me most in Dr. Daly's paper was the picture he drew of the natural history of the disease and it was from that standpoint that he studied it and based his treatment. This teaching the profession would do well to appreciate, namely, that there is, as yet, no specific

remedy, no panacea, for the treatment of gonorrhœa; we must study the pathological changes which occur during the course of the disease and conduct our treatment on general surgical principles. I can add nothing further except to say that this has been my conception of the disease and its treatment for years. Regarding the treatment of strictures: in recent cases where there is narrowing of the urethra coarctation, due to round cell infiltration, dilatation with sounds or bougies is indicated. In old lesions where there is a definite organic stricture, a ridge or band of cicatricial tissue, urethrotomy is the proper surgical procedure.

2. The second paper of the evening was read by Dr. C. E. Holbrook on carcinoma of the cervix uteri, with a short series of cases. This paper appears on page 906 of this number of the JOURNAL.

CASE REPORT: Case of epilepsy in a boy of fifteen, with automatism, by Dr. A. G. Morphy.

The boy is now fifteen years and six months of age, is of English parentage, and came to the Royal Victoria Hospital one and a half years ago with epilepsy. At three months of age he began to have convulsions, the fits being irregular in time of occurrence; he might have three or four in one day or none for a few days. The fits continued until he was eight years old when they ceased but began again at fourteen. The family history is quite negative, after most careful inquiry from the point of view of heredity.

The patient is a pale, stupid-looking boy, palate high and arched, tonsils and adenoids have been removed. He had a peculiar appearance about his face and ears, which it is difficult to describe. He came to the hospital first in September, 1915, having very frequent attacks, three or four in one day. On bromides he improved a bit, but later the attacks came on as frequently as ever. On looking over the reports I have found that the fits have changed in character from time to time; they are sometimes less severe and he does not fall to the ground; at other times they are very severe. The patient's memory has been gradually failing. In March, 1916, the mother reported that his memory was very poor; he could not remember where he had put anything, forgot what he had just done, *e.g.*, he would finish dinner and then ask for dinner some half hour afterwards. One day he sat in the kitchen sink and turned on the hot water; again he would take off his clothes during the day and go to bed and sleep, then wake up and ask why he was in bed. Often he would take off his boots for no purpose whatever. At the end of a month this phase left him, but his failure of memory was more marked; he began to eat excessively

also. He gets 20 grs. bromides three times a day and still has fits, which means that he is a fairly severe case.

The noteworthy points are, first, the interval free from attacks, from the eighth to the fourteenth year, which bears out the statement that in two periods of life these disturbances of equilibrium are more prone to occur, from infancy to childhood, and from childhood to adolescence. The epileptic habit being established again in the second period will probably last for years or the patient's lifetime. The second point is the automatism. This lasted in, this case, for about a month, and I am unable to state why it came on or why it left. Automatic acts seem to be simply unaccountable mental derangement. Sometimes the automatic act is merely a suspension of memory, and then after the patient recovers he realizes that he does not know what has occurred in the interval, as happened in the case of our patient. A driver in London drove his horse and cart six miles across the city, and on recovering himself was quite unable to explain how he had arrived there. On the other hand an action may occur which has no apparent connexion with the patient's actions or conversations before the attack. The essential disturbance in this state is the difficulty of the patient assimilating the sensory impressions that are concerned with environments and joining them up properly with memory pictures, hence delusions and hallucinations.

DISCUSSION: Dr. G. S. Mundie: The subject which Dr. Morphy has brought before the attention of the Society is a most interesting one, and like cancer, we have found no cure for epilepsy. These cases are most interesting from the medico-legal standpoint. As you probably will remember in the trial of Eva Boyle the question was brought up and the defence tried to prove that at the time she committed the murder she had had an epileptic fit; however, the evidence was not strong enough to prove this. One case we had of a man who during these attacks would put everything he could lay his hands on in the stove and when he came out of the fit he had no memory of having done this. Then there is the phase of what the French call *fugues*, in it the patient would suddenly, or quietly, wander off with no idea where he was going and suddenly find himself in a different part of the country or city and could not explain how he got there. This condition is not confined, however, to epilepsy and may appear in cases of tumour of the sphenoidal lobe, etc. There was the case of a soldier in one of our camps who suddenly took up a rifle and shot one or two of his companions and who had absolutely no memory of the act after. It was proved later that he was an epileptic.

Medical Societies

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Annual meeting, Ottawa, September 26th, 1917.
- CANADIAN HOSPITAL ASSOCIATION:**—President—Dr. H. A. Boyce, Belleville. Secretary—Dr. J. M. E. Brown, Toronto.
- CANADIAN PUBLIC HEALTH ASSOCIATION:**—President—Dr. J. D. Pagé, Quebec. Secretary—Dr. J. G. Fitzgerald, University of Toronto.
Annual meeting, Ottawa, September 27th and 28th, 1917.
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